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THE

NATURALIST:

A

MONTHLY JOURNAL OF

Natural History for the North of England

EDITED BY

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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

JOHN W. TAYLOR, M.Sc.　　RILEY FORTUNE, F Z.S.

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EVOLUTION OF THE DRAMA IN HULL AND DISTRICT

By T. SHEPPARD, M.Sc., F.G.S., F.S.A.(Scot.)

Demy 8vo, bound full cloth, containing 200 *pages and numerous illustrations. Price* 10/6 *net.*

This book reviews the drama in Hull and and District from the earliest times, paying particular attention to the performances of miracle plays. Although treating the subject from the local standpoint, the book forms a valuable historical record of the drama in general. In fact, at one time Hull had a theatre, holding 3000 people, that was second only in importance to that of Drury Lane, London. Beverley at one time boasted five theatres, and places like Patrington, Ottringham, Howden, Hedon, Bridlington, Driffield, etc., had their theatres and issued bills.

The volume contains a large number of illustrations specially prepared for the work, with reproductions of old playbills, photographs and drawings of the former theatres, actors, etc. It is a distinct addition to that branch of literature that appertains to the drama.

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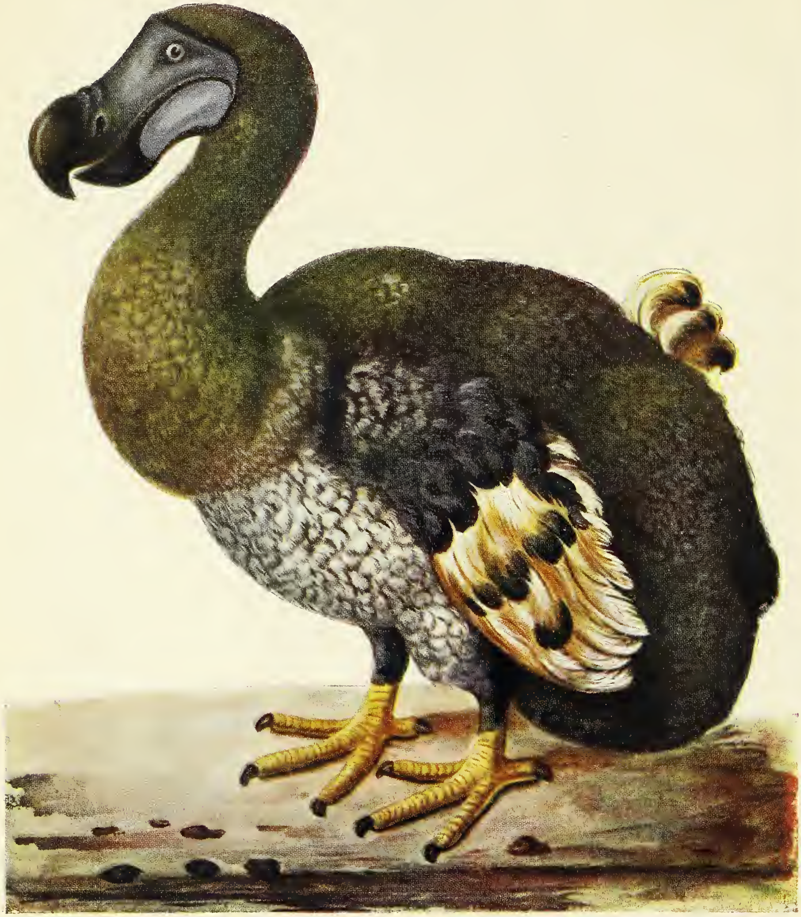


Aquarelle, attributed to Charles Collins (*ca.* A.D. 1736), of the Dodo *Raphus cucullatus.*

From **The Taylor White Collection,**
in the Blacker Library of Zoology,
McGill University, Montreal, Canada.

THE NATURALIST

FOR 1928.

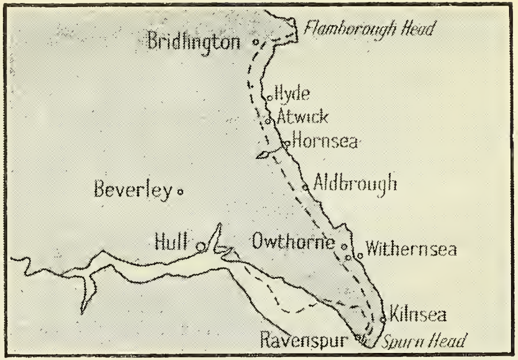
NOTES AND COMMENTS.

THE DODO.

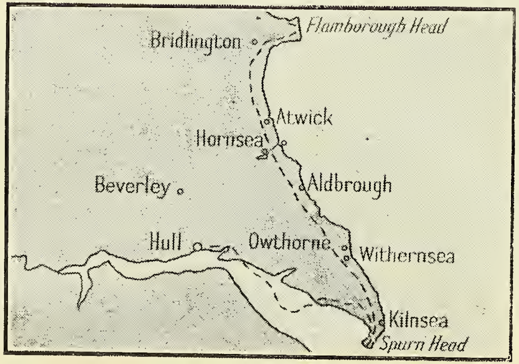
In *The Ibis* for last October, Dr. Casey A. Wood gives two hitherto unpublished pictures of the Mauritius Dodo. He states 'I understand that the previous owner of this remarkable collection rarely opened the portfolios in which the drawings were stored, and that this fact explains the freshness of the pictorial colours and the whiteness of the paper on which they were drawn nearly two hundred years ago. They have all the appearance of having been painted quite recently. In consequence, I am not aware of any other painting now in existence that affords as clear and definite a portrait of the Dodo (*Raphus cucullatus*). It is hardly necessary to point out that the single reason why authentic well-painted pictures of the Mauritius Dodo in the original colouring are important is that there does not exist to-day a single skin of this extinct bird, by means of which its plumage and other external characters may be studied. It seems passing strange that we have so few remnants of either Didine species, that for over a hundred years attracted so much attention, was so widely described and so extensively portrayed. Of the one living Black Dodo that can with certainly be traced from its first landing on these shores (about A.D. 1637) to its preservation in Tradescant's Museum, in 1656, it may properly be said, *pereunt etiam ruinæ*.' By the courtesy of the Editor of *The Ibis*, and of Dr. Casey A. Wood, we are able to reproduce one of the illustrations herewith (see Plate I.). The same journal contains 'First nesting of the Fire-crested Wren in Britain,' by H. W. Robinson, the nest occurring near Lancaster.

YORKSHIRE'S SLIPPED VILLAGES.

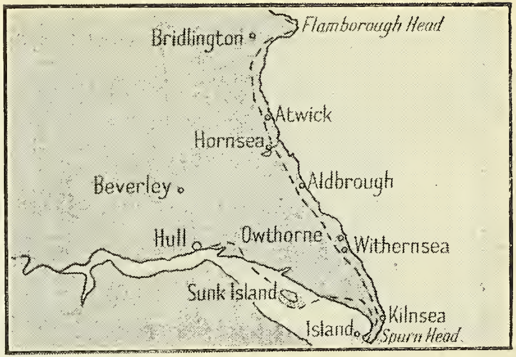
Mr. Arthur Mee's delightful journal, *My Magazine*, for September, which is written for young people, has a series of illustrations of East Yorkshire, accompanying an article on 'The Lost Land of England: Villages Slipping into the Sea.' With regard to these the writer states: 'The first map shows Hyde and Withernsea gone and Hornsea and Ravenspur going. That was in 1527. In the 1610 map Hornsea and Ravenspur have gone, and Spurn Head has begun to take its present toothlike shape. In 1693 Sunk Island first rises out of the Humber estuary, together with a



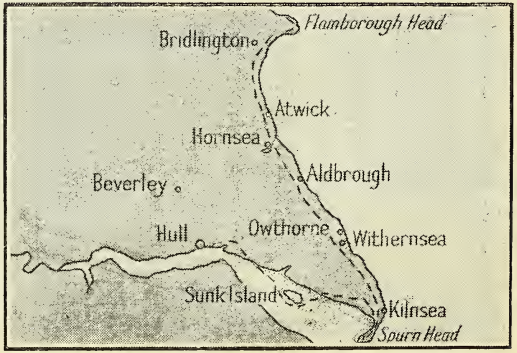
1527. Part of the Yorkshire coastline in 1527. Hyde had disappeared about 1396, and Old Withernsea about 1444.



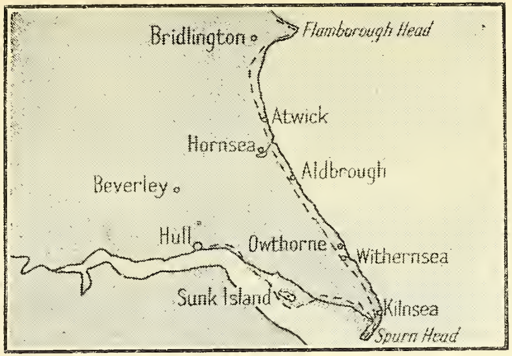
1610. Old Hornsea was lost between 1546 and 1600, and by 1610 Spurn Head had begun to get its toothlike shape.



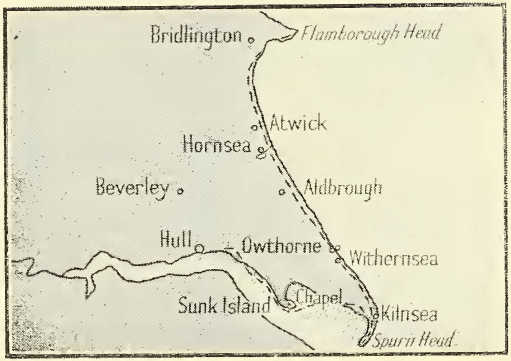
1693. The first appearance of Sunk Island was in 1693, when a small island also appeared off Spurn Head.



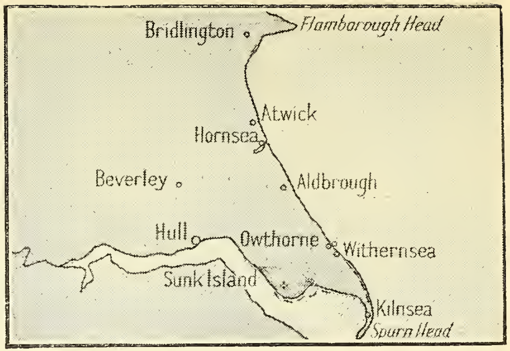
1720. By 1720 sands had gathered round Sunk Island, and the small island near Spurn Head had disappeared.



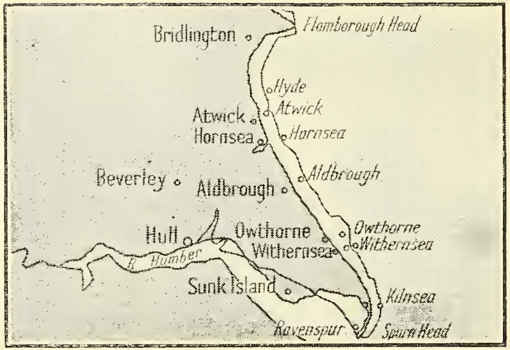
1731. By 1731 the coast was getting nearer to its present shape, (shown by dotted lines), especially at Flamborough Head.



1772. Atwick and Aldborough were rebuilt, and by 1772 a causeway had been formed between the mainland and Sunk Island.



1829. Owthorne and Kilnsea having been lost, they were rebuilt inland, and by 1829 Sunk Island was part of the mainland.



Here we see at a glance how the coastline has changed between 1527 and 1927, the hard, continuous line being that of to-day.

small island inside Spurn Head at about the position of old Ravenspur. In 1720 sands have gathered round Sunk Island, but the little island near Spurn Head has disappeared again. In 1731 Flamborough Head has lost its former squareness, and is approaching its present pointed shape. The great event recorded in 1772 is the joining up of Sunk Island with the mainland. The original Atwick and Aldborough have disappeared, but have been rebuilt inland. In 1829 Sunk Island has been finally incorporated in the mainland, where the village of that name still stands, puzzling many a traveller, no doubt, by its queer name. Old Kilnsea and Owthorne are gone, but new villages have taken their place. The last map reviews the whole position. The land lost in the past three hundred years is shown by a light strip along the coast with some of the chief towns and villages which once stood on it, and a black line behind the bulge of Sunk Island shows the line from which, in the same time, the River Humber has retreated. It is a weird story that these maps record, and a story of which inevitably much has yet to be told. Nowadays we build sea-walls of a strength of which our fathers never dreamed. But even these cannot always hold the waves. We still have much in common with Canute, whatever the flatterers of our day may say.'

CAN SCIENCE MISLEAD.*

The publishers inform us that Colonel Lynch is one of the most versatile of living writers, and speaks with authority on scientific matters. ' Doctors,' he says, ' are a real danger in many cases, tampering ignorantly with complex machinery.' The author himself, in his preface, states, ' Science is great. Discoveries are wonder voyages of the soul ; but those who wield authority in science have not always been fair to their fellow-man ; they have sometimes deceived him, possibly because themselves deceived ; but they have also fallen to the worship of inferior divinities—religious fanaticism or political prejudices ; conventional falsities, hypocrisies, humbugs ; even the lure of social titles and personal distinctions, and other perversions which, though not without a plausible appearance, have wrought signal injustice and introduced grotesque inversions of values. This is the theme of the present book, but in writing it I have not cared to speak in vague discontent.' The chapters bear upon ' Origins of Relativity,' ' The Sacred Science,' ' Biology,' ' Psychology,' ' Vitalism,' ' The Spiritual Idea,' and so on, which we must leave our readers to peruse.

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* By Arthur Lynch. London : John Murray, 376 pp., 7/6 net.

OVERCROWDING IN WATER SNAILS.

The Essex Naturalist, Vol. XXII., Part 1, contains 'Notes on *Methoca ichneumonides* Latr.,' by H. Main; 'Some Field Phenomena due directly to Microscopic Organisms,' by D. J. Scourfield; 'The Birds of the Colne Valley in 1925 and 1926,' by W. E. Glegg; 'The Alien Plants of Essex,' by G. C. Brown; and 'The Effect of Overcrowding on the Growth of the Water Snails, *Limnæa pereger* and *L. stagnalis,*' by F. M. Turner. In connection with the latter, the author concludes that: 'Snails can be dwarfed by overcrowding to a much greater extent than land animals. If overcrowding had the same effect on human beings, slum children would be only 1 ft. 2 in. high at 18 years of age. But the effect in snails is temporary; they grow up normally as soon as given room to grow. The cause of this phenomenon is still doubtful, but probably is lack of food. If this is so, it is surprising how tolerant snails are to semi-starvation without any permanent damage. Similar dwarfing has been noted with frog tadpoles, young fish, etc., and is probably fairly general among aquatic animals. I do not know, however, whether it reaches the same extent as in *Limnæa.*'

EAST YORKSHIRE BIRDS.

Mr. Sidney H. Smith, of York, has presented thirty-one cases of birds to the Haughton School, York, where they will be exhibited in a room together, and will be of value with regard to the teaching of Nature Study. Most of the species have been obtained from York, Flamborough, Spurn, and the Humber. The cases contain a Great Northern Diver; Lapwing and a Wheatear; White-fronted Goose; Bittern; Spotted Crake; Barn Owl, Long-eared Owl, Tawny Owl, and a Short-eared Owl; Egyptian Goose; Whimbrels; Black Guillimot; Merlin; Ringed Plover; Meadow Pipits; Dunlin; Turnstones; Little Grebe; Mute Swan; Blackbirds; Shelduck; Peregrine Falcon; Kingfisher; Common Partridge, Red-legged Partridge; Mallard Wild Duck; Common Curlew; Buzzard; Hawfinch; Bee-eaters; South European Bird; Water Rail, and a Pochard; Fieldfares; Snow Buntings; Sparrow Hawk; and a Shoveller Duck. There is also a case containing small mammals.

LATIN NAMES OF COMMON PLANTS.*

All interested in plants and their names will read this little book with pleasure, and few can turn away from its pages without feeling a deeper interest in the history of botany. In a brief introduction Dr. Drewitt argues for the classical pronunciation, and that the vowel sounds should, as a rule, be given the quantities they would have had in the days of the great Roman and Greek writers ; but he finds it impossible to be quite consistent, and has to fall back on a reasonable compromise between (1) a strict adherence to classical vowel quantities ; (2) the partial neglect of them in Late Latin, for the sake of rhythm and easy diction ; and (3) the changed pronunciation and deterioration of Latin words which have become part of the English language. In the case of words familiar in English for centuries, the popular pronunciation cannot be changed, but when used as a technical name of a plant the classical form might be given, *e.g.*, in Erica, Primula, Mimulus, Lilium, the *i* should be long, Erica should rhyme with mica, not America. In heliotrope the accent should be on the first syllable, and *he* should not be degraded to *hel*. Anchusa should be pronounced ankusa, never 'Ann Chooser.' Popular pronunciation, however, should not always be allowed to set the fashion, *e.g.*, the name of the battleship, *Bellerophon*, is pronounced by sailors, who are authorities on matters connected with ships, 'Billyruffian.' There is a very short account of the three great name-givers, Dioscorides, Pliny and Linnæus.

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* By F. Dawtrey Drewitt, M.A., M.D. London: H. F. & G. Witherby, 1927, pp. 68, 3/6 net.

A BRITISH GARDEN FLORA.*

The days of the familiar books on 'Garden Plants,' by W. Robinson, which half a century ago were stocked by all the booksellers in the country, have passed ; and to-day the demand is for more up-to-date monographs dealing with the increasing interest being paid to garden flowers. In the present work the publishers have issued a valuable manual, dealing with the hardy and half-hardy plants occurring in various British gardens. The book has been prepared rather for the benefit of the gardener, the lover of gardens, and the horticulturist, than for the scientific reader with a knowledge of botany. The first section deals with the 'Structure of Plants,' 'Vegetative and Floral Organs,' 'Transplanting and Pruning,' etc. Part II., deals with the 'Families and Genera of Flowering Plants' ; Part III., the 'Gymnosperms.' There is also an excellent index. The book is well printed, and is illustrated by over two hundred blocks containing many hundred sketches by the author.

——:o:——

Dr. P. Chalmers Mitchell's *Huxley Memorial Lecture* of 1927, on 'Logic and Law in Biology,' has been published by Macmillan & Co. (30 pp., 1/- net). In view of recent events, the address is well worth perusal and careful study.

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* By J. W. C. Kirk. London : Edward Arnold & Co., xi.+584 pp., 42/- net.

THE EVOLUTION AND SURVIVAL OF THE SPIDER.*

WM. FALCONER, F.E.S.

THE subject I have chosen for my address is one of very wide scope, and I propose, therefore, owing to limitation of time, to deal with it not so much in its scientific sequence and abstruseness, as with some of the attendant developments in structure, habit, and instinct which have enabled spiders to survive through long ages to become a dominant race amongst the lower creation ; and further, as they are ' unknown ' animals to most naturalists, to supplement my remarks with a number of illustrative lantern slides.

Until quite recently it was thought that the earliest spiders of which there is any record lived, as their fossilised remains in the Primary rock formations indicate, in the wooded swamps of the mild Carboniferous Period, but about five years ago a dozen crumpled and mostly fragmentary bodies, probably of spiders of a more primitive segmented type, were unearthed in Aberdeenshire from the still more ancient Old Red Sandstone.† At a much later date—in the tropical Oligocene days of Tertiary times—individuals wandering over tree trunks in search of prey became entangled in the drops of resin exuding from pines, and, being held fast, were at length engulfed in them. This resin, one of the most suitable of media for preserving and handing down intact their soft bodies, in course of time became converted into hard clear amber, pieces of which have been since occasionally dug up containing the entombed mummies of these unfortunates. The geological evidence is thus conclusive as to the vast antiquity of spiders. There is other proof of this fact, which, if more intangible in itself, is none the less convincing to Science, in that it must have taken an incalculable length of time to bring about their world-wide distribution, and to produce the immense diversity and complexity of structure, habit, and instinct which are now so characteristic of them.

The ancient forms differed somewhat from those of the present day, as may be seen when one of the oldest of them, the Carboniferous *Protolycosa*, is compared with its modern representative, *Lycosa*, yet their identity is unmistakable ; but if the Evolutionary Theory is true, spiders must have existed previously at some immeasurably more remote age as much simpler organisms. They could not continue in this early form and with it retain their uniform primitive habits and instincts, for the simple reason that life is not a machine-made article, fixed to pattern and unalterable. Growth and progress are essential to its welfare ; it can be, and is, moulded by the conditions around it, and when these change it will endeavour to adapt itself to what is new. But even life, with all its self-assertiveness, tends, if the conditions become too easy, first to stagnate and then to deteriorate, so that there must have been some powerful, ever-present incentives to impel it along the path of evolution. Thus spiders, whatever form they may have assumed, have always been obliged to compete with hosts of others, both like and unlike themselves, in a constant daily search after food, life's first requisite. If successful in this quest, and no other mishap befel them, they lived on, but any failure to obtain it meant weakness, and in the end death, either from exhaustion or by violence. They must have been occupied in ceaseless efforts to escape the attacks of a multitude of pitiless enemies, ever on the watch to destroy them, and been involved in a never-ending struggle against the forces of nature of every kind and degree, not only those of regular occurrence, but also the convulsions, catastrophies, or more gradual changes, which successively altered the configuration and the climate of the earth. Of prime importance in this respect, the gradually encroaching ice of the Glacial Epoch overwhelmed the land as far south as London, leaving within its limits unglaciated areas such as the summits of the Yorkshire hills, on which even in such adverse circumstances some members of its arachnidal fauna, as of its flora, doubtless survived. The English Channel then being non-existent, spiders along with other animals were driven far beyond the southern limits of the ice, with what loss we cannot tell, and the survivors, being brought under new conditions and more crowded, were subjected to keener competition for food and foothold and were exposed to greater risks. The unremitting stress and strain of these conditions, both physical and organic, not acting independently but conjointly with cumulative effect, cannot but have profoundly affected the form, modes of life and instincts amongst others of spiders. Only the strong and vigorous among them, those capable of protecting themselves or accommodating themselves by some helpful variation in one direction or another as the need arose to every varying circumstance of their lot, survived and were perpetuated. The weakly and the unadaptable perished, and their shortcomings with them, so that any improvement effected suffered no setback. Thus continually being sifted, endowered, and every gain in adaptability to their environment accentuated, the simple forms by imperceptible stages at last developed into those wonderfully-made and fully-equipped creatures now known as spiders, able by reason of their acquired superior capacity, both physical and mental, to make a living under almost any conditions and in any surroundings. They are found in the most unexpected places, and doing the most unexpected things. The water-spider, an atmospheric air breather, lives in water the year through. Another kind (*Desis*) has similarly adapted itself to a sea life amongst coral reefs. The raft spider ventures, blown by the wind, on its float of weeds slightly bound together with silk, on deep ponds and ditches, and can totally submerge itself without risk, or run upon the surface and return to its raft. The trap-door spider excavates a snug underground dwelling with a perfectly-fitting door. A Queensland spider, termed the 'magnificent,' spins a short thread at the end of which is a tiny viscid globule. This it whirls with great speed at small passing moths, which, if caught, are then drawn in to be sucked dry.

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* Presidential Address to the Yorkshire Naturalists' Union, delivered at Harrogate, December 3rd, 1927.

† " On some Arachnid Remains from the Old Red Sandstone." S. Hirst, *Ann. Mag. Nat. Hist.*, Series 9, Vol. XII., October, 1923.

There is a certain amount of superficial resemblance between spiders and insects with which they are in consequence too frequently confounded. Both forms of life have jointed appendages such as legs and other organs articulated to the body, and are devoid of an internal skeleton. These are structural characters which, despite the many other momentous changes which have taken place in them, have persisted from a very early stage, and clearly indicate that spiders and insects had a common ancestral origin, that they are, as it were, shoots of the same branch of the genealogical tree of life. In other respects they differ very considerably, and a comparison between them shows that the developments in spiders are of a more advanced type than in insects, giving them a higher rank in the scale of animal life. The same influences must have been brought to bear upon both forms in the past, yet they have been differently affected, and have respectively evolved the bodily form best suited to their particular mode of life. From this point of view untrammelled freedom of movement is more important to the insect, and this has been secured to it, but naturally with some loss of strength, by its trisected body and segmented abdomen, which consequently more closely reproduce the ancestral type. To the spider, on the other hand, as the inveterate assailant of other creatures, strength superior to that of its victims is more essential to the success of its attacks. In order to obtain it, its body has become concentrated, at the expense of flexibility, into two portions only with continuous integuments, the only signs of former segmentation remaining being the sutures of the thorax. The life-cycle of the insect consists of two strongly-contrasted phases, one of gross feeding

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and growth (the larva), the other of delicate feeding and reproduction (the imago), the pupa being the connecting link between them, but the spider has its characteristic form and appearance from birth, and only grows like a child, but with a series of moults, from infancy to age.

The respiratory system of spiders differs remarkably from that of insects ; in the latter it is one of internal branching tubes, air being admitted into them through spiracles ; in the former, as also in some allied arachnids, for the first time in the chain of animal life, one mainly of breathing by means of localised lungs, two in number as in mammals, but very differently constituted. Each consists of a series of hollow bags folded and arranged like the leaves of a book—hence the term ' lung book '—an arrangement by which as large a surface as possible is exposed to the purifying action of the outer air, which obtains access to them through common chambers roofed in by spiracular plates, which form two conspicuous areas usually with a distinct colour of their own, one on each side beneath the forepart of the abdomen. On being compared first with the gills of a fish and then with a normal lung, their peculiar structure is at once recognised as being intermediate in character and function between an apparatus designed for use in water and one for breathing the atmospheric air. This unusual formation throws considerable light on the early evolutionary history of spiders, for it can only be explained in one way. Their ancient progenitors must have originated in the sea, and their descendants gradually adapted themselves from a life in water to an existence on land. In this connection it is interesting to note that a very large number of them have not even yet freed themselves entirely from the impression made upon them by their aquatic experience ; they still prefer to live in damp situations, probably because they find the presence of moisture of benefit to them in promoting the action of the air upon their blood. The transition from one element to another of so opposite a character was also fraught with further and more varied anatomical and physiological possibilities which eventually directed the flow of evolution in them into other channels.

Spiders have in course of time become perfectly adapted to a predatory life. To this end the jaws have been greatly modified and enlarged, especially the falces or seizers, each of which terminates in a strong, curved, pointed, movable poison-injecting fang, which, when not is use, can be closed down into a groove between two rows of teeth like the blade of a knife into its haft ; while the smaller mouth-parts now form a kind of suction tube to extract the juices only of their victims. Apart from some allied arachnids, all other insecteaters devour the whole of their prey. Thus their food is already in a liquid state and highly animalised, and can be taken directly into their blood with very little preparation, and practically without waste. There is no need either for an elaborate digestive system or any large reservoirs for the storage of food or waste material. A slight enlargement of the food passage is all that is needed. The abdomen is largely filled, sometimes considerably distended when food is plentiful, with particles of fat which serve as a food reserve, upon which, in times of scarcity, they can subsist for a lengthy period without obtaining nourishment from outside sources. One example, vouched for by Mr. J. Blackwall, lived in a closed corked phial locked up in a drawer without any food whatever for a year and a half, doubtless an extreme case. This ability to fast is very important, both from a survival and a distributional point of view. Darwin states that they are amongst the first animals to colonise newly-formed oceanic land, while many are now regularly transported alive from foreign lands across wide stretches of sea to our own shores in consignments of oranges, bananas, logwood, tobacco and other vegetable productions, but have with few exceptions been given no chance to establish themselves. The most successful one to domicile itself in Yorkshire is *Theridion tepidariorum*, to be found in almost every old greenhouse throughout the country, hanging up its eggsacs in its web like a butcher hangs up legs of mutton in his shop.

The most valuable acquisition, consequent on the evolutionary process in spiders, and the one most intimately associated with their everyday life is their unequalled spinning mechanism and ability, not only in the manipulation of their silk with the help of their pectinated claws, but also in the number and variety of the things they can make. These for quality and workmanship are unsurpassed by any other creature, coarse work or fine being produced at will and left its natural hue or dyed. They have not, however, learnt to be true weavers in the sense of there being a warp and a woof interlacing each other in opposite directions. The threads are merely placed side by side and adhere by their closeness and intrinsic adhesiveness. Externally the mechanism consists of a number of distally perforated spinnerets, normally four or six, and varying in length, strength and arrangement, according to families and genera. A few British species (*e.g.*, *Amaurobius*) have an extra or supernumerary spinneret situated below the others and differing from them in being flat and transverse and in emitting a specially tenacious bluish silk. Associated with it is a peculiar comb of hooked bristles on the fourth pair of legs (the calamistrum) which cards the silk and deposits it with a curling motion on the framework of the web. These snares, of chalky appearance when old, may be seen in any old wall.

Owing to the rearward position of the spinning apparatus, all the varied and beautifully designed and finished textile work of spiders is executed out of their sight, so that it is no wonder that the wolf spider does not recognise her own eggsac when deprived of it, and will seize and run off with anything about the same size and shape, or that the labyrinth spider (*Agelena labyrinthica* Clerck) will complete her deposition of eggs even if they be removed one by one as they are laid. Webs are the most familiar products of their industry, and these also vary much in form, structure and texture according to the kind, situation and habits of the maker. In the simplest form there is no discoverable method, fine lines crossing each other in all directions (*e.g.*, *Theridion*). The line woven web consists of a horizontal sheet or hammock of very delicate but elastic silk, the maker, when present, hanging back downwards from its under surface (*e.g.*, *Linyphia*). The sheet webs of strong, firm, durable, closely woven silk, are furnished with a tube within which the spider lurks expectant (*e.g*,. *Tegenaria derhamii* Scop.). Both these kinds have labyrinths of lines extending from their margins. Flying insects collide with them and drop into the net below, where they are seized by the alert tenant. The geometric or wheel webs are built on a radiating framework which supports a continuous spiral studded with minute viscid globules, except around the centre, which thus serves as a non-adhesive platform for the spider's use. The globules are not made singly, but a number at a time, in series, so that a very large web containing 120,000 of them can be constructed well within the hour. The maker, when on the web, stations herself head downwards in the centre of it, or when approaching an entangled fly, moves about on the unbeaded framework. Otherwise she carries a thread from mid-platform, the focus to which all the stimuli converge, to a shelter close by, and by placing her sensitive feet upon it, is made instantly aware of any vibration set up in the snare by a struggling captive. Notwithstanding their apparent similarity, three forms are equally common in every district ; one with the centre filled in (*Epeira*), another with it vacant (*Meta*), and a third with a sector missing (*Zilla*). Lastly, there is the triangular snap net of *Hyptiotes*, the construction and action of which are obvious.

According to the Evolutionary theory, there must have been a time when snares did not exist ; the spinning mechanism, too, by whose aid they are made, must have arisen from something of a simpler nature and with a totally different function, externally from modifications of former posterior limbs, the foundations of which are still visible in the embryo, and internally from some primitive secretory organ. Where so many evolutionary complications are concerned, it is not easy to state clearly the exact sequence of the stages of this development, but probably the product of the now excretory organ at some period or other after the germinal linking-up of the component parts of the mechanism attained a consistency which permitted it to be drawn out into a thread, which in time became as serviceable to its possessor as a rope to a man or a tail to a prehensile monkey. And this single thread still continues to be made extensive use of by every spider. Finding that some shelter from the weather or their enemies was necessary, some used their silk to pull loosely together the leaves of the vegetation, amongst which they lived, forming finally the irregular web, or drew together the edges of one. Others laid their lines side by side and afterwards improved the covering into a tube or cell, which was held down by threads attached to neighbouring objects. Tubes and cells are still part of the equipment of many spiders. This achievement led to the trap-door spider making as a further step a tube in the ground as a more secure dwelling. The anchoring filaments perplexed and detained insects, and when this fact was recognised, it was then merely a matter of time, by adding to, lengthening and combining them in various ways, to bring the webs to their present state of efficiency and diversity.

In a mental picture the spider has come to be inseparably associated with a web, but this is not altogether in accordance with fact. A very large number of them never make any kind of snare, but adopt other methods to obtain food. Whether spiders are, or are not, web-makers has been determined by their mode of life. If they are of inactive habits, remaining long in one place, they could not, being wingless themselves, catch winged and elusive insects without some artificial aid, and for this purpose nothing could be more admirably adapted than a web. If on the contrary they are of an active and roaming disposition, first in one place and then in another, any kind of snare, necessarily a fixture, would not be a help, but a decided hindrance. They can and do, of course, spin for other purposes. The members of one section are known as vagrants, and of another as hunters, terms descriptive of their mode of life and the methods they employ to capture prey. Some of both sections construct a tubular or cellular retreat and come out to hunt about in its vicinity, returning to it when their hunger is relieved or they stand in need of shelter from the weather or protection from their enemies. Others conceal themselves temporarily in any convenient hiding place, and seize the insects which enter it, or pounce

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upon those which pass by, and will even pursue them a short way. One vagrant, *Misumena vatia*, which varies in colour from yellow to pink, inserts itself into flowers, choosing those blooms which match with its own tints, and in consequence becomes so blended with its surroundings that the unfortunate insects seeking honey fail to detect it and fall victims to its rapacity. A jumping spider, *Salticus scenicus*, hunts over old stone and brick structures in the bright sunshine, spinning as it goes a dragline which it fastens down at intervals. Being very quick and marked to harmonise with its background it seldom misses the basking flies upon which it launches itself. The smaller wolf spiders have no settled home, but wander swiftly from place to place in search of prey as fancy dictates or circumstances compel, darting under the nearest available cover immediately the sun is obscured or danger threatens. The females are obliged, therefore, to carry their eggsacs with them wherever they go, in one family (Lycosidæ) attached to their spinners behind, and in another (Pisauridæ) held in their jaws. Their nomadic life has one great compensation—their eggsacs are never parasitised by ichneumon flies as are those of other species which are fixtures, the whole contents of the latter failing sometimes, from this cause, to produce any lawful progeny at all. The young also on hatching out climb up on to their mother's back and accompany her in all her wanderings, taking up a position anywhere except about her eyes, which would obscure her vision, or on her legs which would hamper her movements, both disabilities to one of her habits. The larger wolf spiders (*Trochosa*, *Tarentula*) dispose of their eggs and young in the same way, but remain in silk lined rounded hollows beneath the cover of a stone or a tuft of grass.

(*To be continued*).

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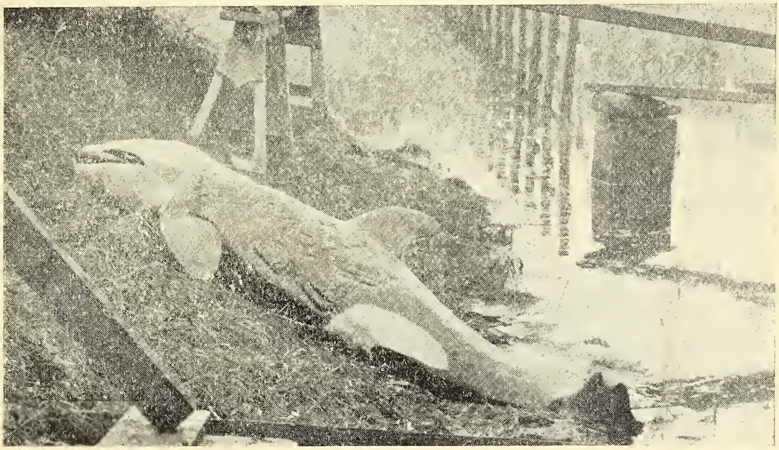
Hawk Moths and Willow Herb.—With reference to Mr. Burkill's query *re* any increase of the Elephant Hawk Moth consequent on the spread of its food plant, *Epilobium angustifolium*, I found the larvæ of this moth not uncommonly, in August this year, on *Epilobium* on Allerthorpe Common, and several other entomologists who were with me at the time also obtained a supply of larvæ. I have never come across the caterpillar before in this locality, which I have worked several times a year for the last ten years at least. The *Epilobium* is certainly spreading on the common, especially in areas where the heather has been burnt. I believe that Mr. Cheetham has found the larva this year on Skipwith Common.—W. J. FORDHAM.

KILLER WHALE (ORCINUS ORCA) AT SCARBOROUGH.

W. J. CLARKE, F.Z.S.

On the morning of November 12th, 1927, I received information that a ' dolphin ' about 8 feet in length had washed ashore in the South Bay. I found that the carcase had been removed within an hour of stranding to an unknown destination. Enquiries from the Coastguard, the Receiver of Wrecks, and the Cleansing Department of the Corporation, produced no information as to its whereabouts, and it was not until late afternoon that I found it, partially buried on the town tip. It was then too dark to make an examination, but I was able to prevent it being further covered up, pending instructions from the British Museum at South Kensington, and it was just possible to distinguish that it was a small example of the Killer Whale.



Photo] **Killer Whale at Scarborough.** [*W. J. Clarke.*

A careful examination on the following morning showed that it was a recently born young male, which had not yet cut its teeth, and still bore on either side of the snout the three stiff bristles, which are only found for a short time after birth. It was in fairly fresh condition, and measured 8 feet 11 inches in a straight line from the tip of the snout to the middle of the caudal fin. The colour was lighter than that of an adult, being a slate grey on the upper surface, and yellowish beneath. The oblong light spot behind the eye was not very well marked, and the one often found just behind the dorsal fin was missing altogether. The pectoral fins were short and rounded, quite unlike the very long and broad flippers of the adult male, which measure about one-fifth of the entire length of the animal. The dorsal fin was also short and weak as compared with the huge erect structure borne by the adult. The head and flippers were sent to the British Museum, and were described by Mr. W. P. Pycraft as 'most exceptionally interesting specimens.'

The Killer Whale is the most voracious of all the cetaceans. It attains a length of 30 feet for adult males, and 25 feet for females. It is not of common occurrence on the British coasts, and between 1913 and 1926 only seven occurrences were noted, none of which was in Yorkshire. Only once before has the species been found in British waters in November, the majority of records been made during the warm months. It is recorded in Bell's 'British Quadrupeds' that in 1861 an example of this species, measuring 21 feet, taken on the coast of Denmark, contained in its stomach the partially digested remains of 13 porpoises and 14 seals, and the whale had choked itself by trying to swallow a fifteenth seal.

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Grey Hen near Wetherby.—While shooting my coverts at Hunsingore on November 23rd, one of my guests, during a partridge drive, shot a Grey Hen. So far as I know, the nearest moor on which there are black game is Blubberhouses, about 15 miles distant.—JOHN W. DENT, November 25th, 1927.

Black-throated Diver.—An immature Black-throated Diver in characteristic winter plumage was shot at the Brick Ponds, Tollerton, near York, by Mr. W. Benson, on December 7th, 1927. It was sent to me for identification, this being confirmed by W. E. Collinge, who has retained the specimen for the York Museum.—S. H. SMITH, F.Z.S., 25 Park Place, York.

Hawk Moths and Willow Herb.—While it is true that *Chærocampa elpenor* larvæ have been found to eat most of the species of *Epilobium* and *Galium*, the moth is essentially a frequenter of watery places, and there is no doubt that its primary food plants are *Epilobium hirsutum* and the water bedstraws. I think, therefore, that its occurrence on *E. angustifolium* in dry localities is perhaps rather in the nature of an accident, and that the spread of the plant in such localities would not be likely to be followed by a commensurate increase in the number of moths. The moth is a lover of the open, while *E. angustifolium* is mainly a woodland species.—C. NICHOLSON, Dale End, E.4, December, 1927.

THE MANCHESTER MUSEUM AND ITS PLACE IN EDUCATION.

SIR WILLIAM BOYD DAWKINS, D.SC., F.R.S., F.S.A., F.G.S., ETC.

THERE are but few who realise the important place of the Manchester Museum in general education, and still fewer who know the difficulties that had to be overcome in its organisation out of the chaos that existed in 1869, when I undertook the task. The story of the making is well worth telling, but in this article I shall only treat the Museum as a 'going concern,' a living force in the intellectual life of Manchester, influencing all classes, and particularly those tied by their occupations to the district.

It is a museum of a new type, adapted to the special needs of Manchester, and organised to show the place which man and his works occupy in the geological record.

When J. R. Green and I were undergraduates at Oxford in the late 'fifties we were deeply interested in the problem of the relation of geology to history, and we resolved to see what could be done towards its solution. His field of energy was the history of Britain in the written record, while mine was the vast, and then undefined, period before history, revealed by archæology and geology. He accomplished his task nobly in a series of historical works now of world-wide reputation, while I, after more than sixty years, have not yet finished mine. It was necessary before dealing with the results of the new sciences of archæology and anthropology to revise the geological classification, and this I did in 1866 in a paper which I read before the Geological Society of London on the classification of the Tertiary period by means of the mammalia. This classification has been universally adopted, and has proved applicable not merely to Europe, but to the whole world, with the exception of Australia. It is this revised Tertiary classification that is used in the Manchester Museum.

The general organisation is based on the sequence in time. Inorganic nature—represented by the elements, the minerals, and the rocks—forms the basis, and then follow in due order the galleries illustrating the incoming of animals and plants. First, the endless variety of extinct types of mollusca and other invertebrates in the Cambrian and Silurian rocks, the fishes of the old red sandstone, and the forests of the coal measures, all belonging to the Primary period, when newt-like creatures were the highest forms of life on the earth, and there were no reptiles, except in the last or Permian group. Then come the Secondary strata, characterised by the vast numbers of extinct reptiles, masters of the air, the land,

and the sea, and in which the mammalia were small in size and of a low type (*Metatheria*).

Then follows the Tertiary period—the last of the three divisions of the geological record. It covers the history of the rocks from the close of the Secondary period to the alluvia and sands and gravels of the present days. In the Tertiary the higher mammalia are seen to have passed through a series of extinct forms to their place in existing nature, so that anyone interested in the Darwinian theory of evolution can trace the successive stages by which the living species have become what they are.

Also the long-debated question of the first appearance of man on the earth is answered by the groups of specimens in which he is shown to be the last and most highly organised representative of a long line of ancestors linking him with the higher apes in the immeasurable past. He appears first as a hunter at the close of the Pleistocene period, when Britain formed part of the Continent ; and after it became an island, in the Prehistoric period, he rose to the pastoral, agricultural, and commercial stages of culture, until ultimately he arrived at the civilisation of to-day. Thus we can trace the history of man far beyond the range of historical dates into a remote geological past, just as we can trace the plants and animals of the present day to a past still more remote.

The living flora and fauna, arranged in due order, follow the geological section and complete the Natural History Museum. In 1912 the block for the Egyptian collection was added, and in the present year a further addition has been made for the reception of ethnology.

This new type of museum has now been in use for more than forty years, and has enabled the University to give an education in natural history hall-marked by the high position the students have attained in after-life. It is the first museum to be used in the elementary schools in systematic courses of teaching, which are proved by nearly ten years' experience to have a stimulating effect on the children in their other studies. In this it has set an example to be followed elsewhere.

The museum is also a centre for the various societies, geological, antiquarian, and geographical. It has been made intelligible by public lectures and demonstrations, and its influence is proved to extend far beyond our own country by the number of distinguished foreign visitors who are attracted to our collections and to the light which they throw on the history of man and his place in the story of the earth.

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Among the purchases recorded in the Annual Report of the Curator of the Northampton Museum are two mammoth tusks and a reindeer's antler from a local brickyard.

SECONDARY FOLIAGE IN YORKSHIRE TREES AND SHRUBS.

PROF. J. H. PRIESTLEY, F.L.S.

The weather this (1927) summer has been far from normal, and it is not surprising that, as a consequence, the recent meeting of the Botanical Section found special features of the vegetation to discuss. The Secretary, Mr. Cheetham, had a note in *The Naturalist* for September (p. 278), in which he asked members to pay special attention to secondary leafage in trees and shrubs. The result was an interesting discussion, of which the present note is the outcome.

The deciduous habit of the trees in this country is obviously connected with the seasonal cycle. During the spring the buds are breaking and the young leaves growing out into the summer crop of foliage. In the horse-chestnut all the leaves thus emerging were already present in the winter bud, but in the privet new leaves are continually being formed at the growing-point, and continue to grow out. In the later months, perhaps from the end of June onwards, the terminal growing-point is producing the scales of the new bud, and buds are also forming in the axils of the leaves.

Thus, by July, in many trees the spread of foliage has reached a static condition, and the buds are slowly maturing. But in this wet season premature development of these buds, a phenomenon that always occurs sporadically, which Mr. Beanland says he always expects to see in Yorkshire in July, was a very marked feature of the vegetation. In trees such as the oak, where the young foliage is very different in colour from the mature, the phenomenon is particularly striking. Mr. Cheetham stated that he observed it from the railway train all the way from Leeds to London, along both the L.M. & S. and L. & N.E. routes. On observation being directed to the subject, secondary growth was found in the majority of trees and shrubs in some part or other of the county. Thus, around Huddersfield, Mr. Wattam reports it as general in *Quercus sessiliflora*, present occasionally in sycamore, and showing slightly in ash and birch. Mr. Beanland says 'secondary growth was well to the fore in hawthorn, sycamore, elm, lime and ash, and now (Sept. 29th), in places where trees exposed to the late rough winds have lost all their spring growth, the secondary growth leaves persist and exhibit the length of growth beautifully. Some hawthorns in Hawkesworth valley had a secondary growth ten inches long, but that is an extreme case, the average growth of oak, elm, etc., will be no more than 4½ in. to 5 in.' Mr. Wattam states that the average growth on the oak varies from 6 in. to 12 in.

in the main axis, with new lateral branches 4 in. to 8 in. From Shipley Mr. H. Dibb reports the phenomenon as frequent in oak, hawthorn, elder, elm, and alder, and occasional in birch, horse-chestnut, hazel, sycamore, beech, ash, mountain-ash, lime, willow and poplar. Mr. Wilson also reported it as very common in Carnarvonshire, and Mr. Cheetham noticed it in the plane trees of the London streets ; the phenomenon was, therefore, probably widespread in England this year, just as was the unseasonable weather.

In an ordinary season it is probable that much more secondary growth is seen in the western and moister parts of the country. The contrasting experience of the Horticultural Experiment Stations at Long Ashton, near Bristol, and East Malling, Kent, is interesting in this connection. At Long Ashton, standard fruit trees are in full foliage by the end of June, and shoot growth stops until towards the end of July. Growth then recommences, and continues sometimes until well into September. As a result the trees tend to develop long shoots, which bear in following years flower and fruit above long barren stretches of stem.* On the other hand, at East Malling, the same type of tree will have quite a different appearance owing to the small extent to which this late season growth manifests itself.

Much more work must be done before the full story can be written of these secondary shoots : these are called ' Johannistriebe ' by the German workers, thus connecting them with St. John's or Midsummer Day, June 24th ; they are usually much later than this in Yorkshire. Their appearance is obviously connected with a disturbance of the normal growth rhythm of the tree. Two growth periods can usually be distinguished :—(*a*) a period of leaf development associated with shoot extension, and (*b*) a period of bud development which coincides with a period of nodal growth alone in the axis. This rhythm is the result of an oscillating balance of internal factors, of nutrition, such as the carbohydrate nitrogen ratio, of water supply in the tissues, etc. The period of foliar development and rapid internodal extension seems to be correlated with high nitrogen and abundant sap in the shoots with favourable external temperatures ; but if the carbohydrate reserves accumulate, and water becomes limiting, then growth continues slowly, but is confined to the construction of the buds, consolidation of the nodes, and, for a time, internal increase in diameter. Later, this internal cambial activity stops, as storage materials such as starch accumulate, first beneath the buds and then throughout the plant.* Secondary thickening in the Dicotyledon usually begins at the base of the buds and spreads from thence downwards along the trunk, and thus, quite late in the season, into the roots. When the roots are thus increasing in girth, many observations suggest that an impetus is also given to new root production, which is thus more active than it has been since the main crop of fibrous roots arose in the spring.† This increased root area, if the summer is warm and wet, may mean a vigorous movement of sap into the branches once more, with, as a result, an increase of nitrogen and sap in the shoot.

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* B. T. P. Barker and H. Lees : ' Factors Governing Fruit-bud Formation.' *Annual Report Agric. and Hortic. Station, Long Ashton,* 1916, pp. 46-64.

The result is the premature out-growth of the maturing buds, as the 'Johannistriebe.' These new shoot extensions may be associated with renewed cambial activity in the stem, so that a double annual ring may be seen in the first formed part of the year's shoot. Jost ‡ observed this occasionally, but usually the secondary shoots emerge very soon after the first growth has stopped length extension and before cambial activity has stooped. In this case, the annual ring in the basal portion, though perhaps unusually wide, is not divided into two zones of differently characterised lignified elements. These double annual rings are more frequently met with when the first crop of foliage has been lost through insect attack late in the season. Mr. Flintoff reports defoliation of the primary foliage of ash and oak in the Goathland area, this year, as the result of frosts in the late spring, with considerable secondary growth as a result ; probably, with such early defoliation, secondary growth would begin too early to give rise to double rings of wood.

These 'Johannistriebe' often show another feature of morphological interest. The bud-scales, which have thus grown out prematurely, may show much divergence from the normal form. Dr. Adriance Foster communicated to the Section some very interesting observations he had made on this subject in America. It is hoped that these may form the subject of a paper to be published later.

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Mr. C. Reginald Grundy's 'Lessons from America in Museum Organisation and Upkeep,' a paper read at the Isle of Man Conference, with the discussion thereon, appears in *The Museums Journal* for December.

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* T. Swarbrick : 'Studies in the Physiology of Fruit Trees.' *Journal of Pomology and Hortic. Science*, 6. pp. 137-156. 1927.

† B. T. P. Barker : 'Studies on Root Development.' *Annual Report Agric. and Hortic. Station, Long Ashton*, 1921, pp. 9-20.

‡ L. Jost : 'Ueber Dickenwachsthum und Jahresringbildung.' *Bot. Zeit.* 49. 1891.

REVIEWS AND BOOK NOTICES.

Common British Wild Flowers Easily Named, by **T. Ernest Waltham, F.R.H.S.** Oxford University Press, xvi.+194 pp., 3/6 net. In this useful little volume the author has figured 180 species of the commoner flowering plants growing wild in Britain. Each occupies a page, together with the name of the family, botanical name, and the common names in English, French, and German. The figures are, on the whole, good, and a great help to identification by the beginner. To each type some interesting details are given, including the common insect visitors and edible or poisonous properties.

Economic Biology for Students of Social Science, by **Phillippa C. Esdaile.** London: University of London Press, xi.+175 pp., 7/6 net. In this volume, dealing with 'Harmful and Useful Animals,' the author has dealt with the subject from a somewhat unusual angle, and refers to Biology from the point of view of the household. It is specially written to meet the requirements of Health Visitors, Sanitary Inspectors, Nurses and Institutional Managers, though naturally it appeals to all those who take interest in household matters. There are 150 illustrations and diagrams, which do much to elucidate the text. These principally refer to the various parasites and injurious insects, and other forms of life which are detrimental to health.

Spring Flowers of the Wild, by **Edward Step, F.L.S.** London: Jarrolds, viii.+192 pp., 5/- net. This is an attempt, by the writer of many well-known books on flowering plants, to deal in a popular manner with a few of our commoner wild flowers from the point of view of Ecology, 'based on the common observations of many years that a particular species of plant will, as a rule, be found growing in certain places and in association with a group of others,' and the author believes that readers would appreciate a series of suggestive chapters in which representative flowers are grouped according to habitat and season rather than in orders and genera of the text-books. In seven chapters are described the spring flowers of the Beechwood, Chalk Downs, Oakwood, Meadow, Pasture, Bank and Hedge-row, and Forest. There are thirty-eight good illustrations from photographs.

The Structure and Development of the Fungi, by **H. C. I. Gwynne-Vaughan** and **B. Barnes.** University Press, Cambridge, 1927, 384 pp., 15/- net. One welcomes a new book on mycology of this type, especially at the price of the present volume. The Introduction of 41 pages covers the morphological and biological aspects of the fungi in general, and the authors show that the response to external stimuli exhibited by these plants can, in most cases, be related to the distribution of spores, or to nutrition. Different sections of the work deal with the Phycomycetes, Accomycetes, Basidiomycetes, and the Fungi Imperfecti, although the treatment of these different groups is somewhat unequal. The thoroughness with which the Phycomycetes are dealt with is not surpassed in any modern text-book, and this section, occupying some 80 pages, is a very valuable portion of the work. In another section the Accomycetes, as might be expected by anyone familiar with the researches of Dame Helen Gwynne-Vaughan and her colleagues, are adequately dealt with, particularly from the cytological point of view. The Basidiomycetes receive generous treatment, whilst the Fungi Imperfecti are rather curtly dismissed. The book is well illustrated with 285 figures, some of which, however, are duplicated, and all of them are calculated to elucidate the text. We do not think anybody will ever see a plant just like that sketched as *Penicillium glaucum*, Fig. 96, and we disagree with the use of the name for any fungus. This, however, is a very small demur from a book which contains so much valuable information, and which should have a place on the shelves of every student in any way interested in the fungi.—F.A.M.

MARINE ZOOLOGICAL NOTES FROM SCARBOROUGH.

J. A. STEVENSON.

Between April 26th and the middle of November, 1927, the men of the Scarborough trawler, *Expert*, have kept us twenty specimens of the Long-armed Munida (*M. rugosa*). From May to September I was away, but before I went I got a large jar of formalin, which I left on the *Expert*, asking the men to put into it anything unusual they brought up in the trawl.

On my return I obtained the jar, which contained: nine specimens (all males) of the Circular Crab (*Atelecyclus heterodon*); fourteen specimens of the Long-armed Munida, males predominating; one specimen (female) of Pennant's *Ebalia*; a fine female specimen of the Cleanser Swimming Crab; one four-horned Sea Bullhead (*Cottus quadricornis*); and lastly, several small, common members of the Pycnogonidæ.

It is evident that where these things were caught (twelve miles off Hayburn Wyke), both the Munida and the Circular Crab, both formerly classed as rare or not common in this district, are found in considerable numbers, as everything in that jar of formalin was caught within the first week of July. The men of the *Expert* told me that they could have filled a cart with things for me by the time I came back! This fishing ground off Hayburn Wyke is undoubtedly the best for ‘ curios ’ in the district, as I have not received nearly so many varieties from any other trawler fishing elsewhere.

From time to time throughout the year I have found specimens of a small squid on board trawlers fishing ‘ inside.’ Mr. Clarke kindly sent up two to the British Museum, where they turned out to be *Alloteuthis subulata*, new to this district. They are certainly not rare here.

On April 18th I received a nice specimen of the sponge, *Chalina oculata*, from the men of the trawler *Euphony*, trawled off Whitby.

On May 12th the men of the trawler *Eccleshill* gave us a Northern Stone Crab (*Lithodes maia*), with spawn, this being the first specimen I have seen with it. The spawn was purple in colour. The crab itself is not at all rare.

On April 11th there was a 4½ ft. Sturgeon on the fish-market.

On April 20th some crabbers kept me a specimen of the Snake Pipe-fish, which had entered one of their crab pots. It seems wonderful to me how such a thin fish could have been pulled up to the surface without slipping through the mesh of the pot. A little later, on April 26th, the *Expert* kept us a specimen of the Greater Pipe-fish, which differs from the other in having a tail-fin when fully grown. On the same day I received the only Long-armed Munida I have seen with spawn, which was a transparent grey.

A few specimens of the curious little Ebalias or Nut Crabs have turned up. The most common species here is *Ebalia pennantii,* of which I found a practically white specimen on April 30th. Their usual colour is dark red-brown. One or two other specimens of this crab have turned up, but they are by no means numerous, being most common off Hayburn Wyke.

On the 2nd of this month I found a fine male of another species (*E. cranchii*) on the deck of the *Expert.* This is new to the local list. On its carapace was growing a large sprig on *Alcionidium gelatinosum,* also new to this district. The crab was hardly half an inch across, while the zoophyte was 4 in. long—and thick at that ! It must have grown on the crab since its last moult, which suggests that either the crab grows exceedingly slowly, or the zoophyte exceptionally quickly.

On May 3rd and October 8th I procured two flatfish from ' inside ' trawlers. On Mr. W. J. Clarke sending them up to the British Museum, we discovered them to be the Norwegian Topknot (*Scophthalmus norvegicus*), new to this district. They were both caught off Whitby. On May 9th we received a specimen of another species of Topknot (*Zeugopterus punctatus*), which had found its way into a crab pot off the Castle Hill.

On May 11th a fisherman showed us a ' curio ' of his own. It was the claw of a common Edible Crab, but it had *three* movable fingers, all working independently of each other.

On May 23rd the men of the Scarborough drifter *Silver Line* presented me with a dried specimen of the Knotty Cushion Starfish (*Hippasteria phrygiana*) from the Dogger Bank. The fishermen call them ' sea elephants,' because they sometimes bend the sides of the starfish over, and by tying them like this, make them look something like an elephant, in shape.

While on the trawler *Euphony*, on May 31st, I discovered a large and fine colony of the curious tube-building worm, *Hydroides norvegica.* The worms themselves are minute, but the whole colony was 12 in. long, by 9 in. broad, by 6 in. deep, and was somewhat of the shape of a ' monkey-nut.' At first sight one would think it was a large, petrified sponge. It is new to this district.

Another large male Velvet Crab (*Portunus puber*) turned up on June 1st. It was caught in a crab pot off Robin Hood's Bay.

The parasitic barnacle *Sacculina* is quite common on the tails of the Marbled Swimming Crab here, though not mentioned in the local list.

Two examples of the Octopus, *Eledone cirrhosus*, turned up in October, one on the 10th, from off Hayburn Wyke (caught by the *Expert*), the other from deep water off Whitby on the 20th.

Several times while searching on trawlers' decks I have come across a certain Hermit Crab, differing from the common kind, *Eupagurus bernhardus*. On sending one up to the British Museum, I learnt that they were *E. kroyeri*, new to this district. With the specimen I sent up its refuge, not being able to tell what it was. It turned out to be *Suberites domunculus*, a sponge, also new to the district. I have never found this Hermit Crab inside anything else but this sponge, although I have often seen the commoner kind in it.

The last thing I have to record is *Rossia macrosoma*, a Cephalopod, caught by the *Expert* off Hayburn Wyke. It is new to this district. It was given to me on November 2nd, and was a very good specimen. I have it preserved.

——:o:——

Ray's Bream in E. Yorks.—On November 4th a specimen of Ray's Bream was washed up on the shore at Withernsea and sent to the Hull Museum by Mr. R. Drewery. It weighs 5 lb. 6 oz., and is 23 inches long and 12½ inches deep, including the fins. It is very similar to the specimen figured in *The Naturalist* for February, 1925.—T. S.

Record Salmon for the Yorkshire Esk.—On October 21st, 1927, Mr. Joseph Maughan, of Sleights, near Whitby, a member of the Esk Fishery Association, fishing at Jillson's Holm, near Grosmont, took the largest salmon ever recorded for the River Esk as taken with rod and line. The fish, which was a male, was taken on prawn, and weighed 31 pounds, the length being 44 inches and the girth 23 inches.—F. SNOWDON.

The 'Solitary Ant,' Mutilla europæa, near Ravenscar.—The finding of this interesting species is perhaps sufficiently infrequent to warrant the recording of two specimens on the moors near Ravenscar, North-east Yorkshire. For many years I have sought casually for this species without success until August 4th of this year, when a female specimen ran across the moorland road just below Stoupe Brow, between Robin Hood's Bay and Ravenscar. This has been placed in the Hull Museum. Two days later I obtained another, also a female, on the continuation of the same road, but nearer Ravenscar.—T. STAINFORTH, Hull.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

This Society has recently celebrated its jubilee. Mr. W. Buckley showed a drawer of *Lycæna icarus*, including a fine var. *striata* from Delamere. Mr. B. H. Crabtree, vars. of *Abraxas grossulariata*, bred by the Rev. G. Raynor by pairing the light Warrington form with variety *varleyata*. Mr. R. C. R. Crewdson, *Melitæa aurinia* and *Lycæna minima* from Blandford ; *Thecla betulæ* bred from Monks Wood ; *Eurois herbida* from Delamere ; *Cœnonympha typhon*, *Erebia epiphron*, *Boarmia repandata*, *Psodos coracina*, *Hyppa rectilinea*, *Mamestra contigua*, and *Aplecta tincta* from Rannoch ; *Celæna haworthii* and *Aporophyla lutulenta* from Kinlochewe, Ross-shire. Mr. S. P. Doudney, *Leucophasia sinapis*, *Eulype hastata*, *Tephrosia luridata*, *Asthena blomeri*, *Epione advenaria*, *Numeria pulveraria*, and *Miona murinata* from Symonds Yat ; *Agrotis ashworthii* and *Epunda lichenea* bred from Penmaenmawr larvæ ; *Tephrosia punctularia* from Witherslack ; *Lithosia griseola* and *Acidalia marginepunctata* from N. Wales. Mr. Doudney also showed a specimen of *Acherontia atropos* recently captured under a railway bridge at Roby, near Liverpool. Dr. Garrett brought an exceptionally instructive series of *Aricia medon* (*Lycæna astrarche*) collected from Durham by Mr. W. Carter. These were placed beside a drawer of the same species collected in the Witherslack area by Mr. A. E. Wright. Both showed the extraordinary variability of the insect, and although the North-west had produced many specimens of great interest, none possessed a completely white discal spot, nor showed the almost complete obsolescence of the black spots on the ocelli, which is so noticeable in many of the Durham forms. There was, however, no evidence before the meeting to prove conclusively that the latest interpretation of the name *salmacis* belongs to a variety which can be deemed recognisable and distinct from some of the forms occurring in Scotland.

Mr. and Mrs. A. W. Hughes showed *Melitea cinxia*, *Colias edusa* (bred), and *Arctia villica* from the Isle of Wight ; *Papilio machaon* from Wicken ; *Bombyx callunæ* var. *olivaceo-fasciata* ♂ and ♀, bred from Wallasey. *Eurois occulta* bred from East Suffolk, *Lithomoia solidaginis* from North Wales, and insects from Rannoch similar to those of Mr. Crewdson, including a melanic specimen of *Boarmia repandata* among a long series of the usual Scotch form.

Mr. C. F. Johnson brought his cabinet drawers of *Cœnonympha pamphilus* and *Fidonia atomaria*, both species showing remarkable variation. Mr. F. D. McMullen exhibited *Bombyx quercus* var. *callunæ* bred from Witherslack ; *Satyrus semele* from the Lancs. sandhills ; a variable series of *Thamnonoma wavaria* from his garden at St. Helens, and *Cucullia verbasci* from Bedford. Mr. Wm. Mansbridge, on behalf of Mr. Henry Watson, butterflies from the Arctic regions, belonging to the genera Papilio and Colias, some from the farthest north yet explored, and displaying modifications of colouring according to their range. Mr. F. N. Pierce a variable series of *Tortrix caledoneana*. Mr. S. Gordon Smith specimens of *Eurois herbida* and *Amphipyra pyramidea*, captured at light in Chester, both being interesting records for the city ; *Sphinx convolvuli* from the same district ; a magnificent collection of *Arctia caja* varieties, and cabinet drawers illustrating portions of the genera Tryphæna and Boarmia. Mr. R. Tait, *Chærocampa elpenor*, *Dicranura bifida*, *Nonagria arundinis*, *Meliana flammea*, *Leucania obsoleta* and *Aplecta advena* from Wicken in June ; a very dark specimen of *Aplecta nebulosa* from Northants ; *Leucania impudens*, *Helotropha leucostigma*, *Calamia phragmitidis*, *Triphæna interjecta*, *Cosmia affinis*, *C. diffinis*, *Catocala nupta*, and *Lithosia griseola* from Wicken in August ; also a bred series of *Agrotis agathina* from Penmaenmawr larvæ. Mr. R.

Wilding a box of Coleoptera, family Lamellicornia, largely of the genus Aphodius, collected principally on the Wallasey sandhills ; and Mr H. W. Wilson a ♀ *Callimorpha quadripunctaria* taken at Dawlish on 4th September, 1927, a cocoon of *Dicranura bifida* spun up among moss, and anchored to the bottom of a box by merely an eighth of an inch of its surface ; a ♂ *Saturnia pavonia* with the orange of the hind wings replaced by yellow ; also a greasy looking example, the result of in-breeding to the fourth generation.—Arnold W. Hughes, 14 Cliff Road, Wallasey.

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VERTEBRATE ZOOLOGY IN YORKSHIRE.

E. WILFRED TAYLOR.

A meeting of the Vertebrate Section of the Yorkshire Naturalists' Union was held in the Library of the Leeds Philosophical Society, on Saturday, October 22nd, Mr. E. W. Wade occupying the chair.

The sectional meeting was preceeded by a meeting of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee, and of the Yorkshire Wild Birds and Eggs Protection Acts Committee.

The general and financial reports of the Yorkshire Wild Birds and Eggs Protection Acts Committee, and the reports of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee were presented and approved.

Mr. E. W. Wade was unanimously re-elected President of the Section for 1928 ; Mr. F. H. Edmondson was elected to the Yorkshire Mammals Committee, and Mr. W. J. Clarke to the Wild Birds Protection Committee.

Mr. H. B. Booth referred to Mr. H. W. Robinson's note entitled 'Wild Cats on Westmorland-Lancashire Border' which appeared in *The Naturalist*, No. 849, page 292, and a resolution was passed urging that the skin of this wild cat be sent to South Kensington for examination, Mr. Booth undertaking to defray the expense. Mr. Booth exhibited a Squid from Aberdeen (which Mr. W. J. Clarke identified as the common species), and announced that the Kapok's nest exhibited at the last meeting had been identified as that of the Cape Penduline Tit.

Mr. E. W. Wade exhibited eggs of the Lesser Tern, marked with indelible ink, and showed that the marks could be almost removed ; a more effective method of marking the eggs, and rendering them useless to the collector, is required.

Mr. R. Chislett exhibited a nest of the Golden Oriole from Geneva.

YORKSHIRE MARINE FISHES.

A lecture was given by Mr. W. J. Clarke entitled 'Some Yorkshire Marine Fishes.' He gave a brief survey of some of the more interesting of the species found in the waters bordering the Yorkshire Coast. Most of those mentioned had been taken in the nets of the Scarborough trawlers, which do not make long journeys from port.

Several species of Gurnard were shown, including the Grey Gurnard, the commonest Yorkshire species ; the Sapphirine Gurnard, the largest of the British members of the family ; and the Red Gurnard, a rare Yorkshire species, although common further south.

The Angler is an abundant Yorkshire fish of curious appearance and very singular habits. The first spine of the dorsal fin is placed very far forward on the top of the head, and bears a tag of skin on its extremity. This is waved about, and attracts small fishes, upon which the Angler feeds. This 'fishing rod' is attached to the bone of the head by a joint which permits free movement in all directions.

The two species of Weevers are the only venomous fish found in

British waters. The Great Weever, growing to a length of 17 inches, is not very common in Yorkshire water, but the Lesser Weever, growing to a length of six inches, is abundant in the shallow waters of sandy bays, where it buries itself in the sand. Both can inflict severe wounds by means of the strong grooved spines of the dorsal fin and operculum, the venom being a modification of the ordinary mucous covering the skin of the fish. An old woman (recently deceased), who lived at Filey, used to be credited with the power of being able to cure the wounds caused by these fishes ; she stroked the injured limb and uttered an incantation over it. The lecturer had been assured by some of the persons so treated that the pain ceased almost immediately the treatment commenced.

The Wolf Fish, the largest of the British Blennies, is a formidable species dreaded by the fishermen on account of its powerful teeth, with which it can bite through a strong leather boot and inflict severe wounds. It feeds on shell fish of various kinds, the shells of which are cracked up by powerful crushing teeth in the palate and throat. The broken shells are swallowed, and either dissolved or ejected from the mouth. Before the war the Common Pecten was the usual food, but these disappeared between 1914 and 1918, and the food now consists very largely of the brittle star-fish.

The Viviparous Blenny, or ' Tom-pout,' is a common rock pool fish in its younger stages, moving into deeper water on reaching maturity. It is remarkable for giving birth to active perfectly-formed young, capable of foraging for themselve from the moment of their birth.

Several members of the Cod family were mentioned, including the Common Cod, of which three well-marked varieties occur in our waters : the Pollack, Coalfish, Power Cod, Pout, and three and five banded Rocklings also belong to this family.

The Flat-fish family are subject to frequent colour varieties of the lower surface, and a series of slides was shown illustrating different degrees of pigmentation. The Dab, Plaice, Lemon Sole, Turbot, and a reversed Flounder, in which the eyes were at the left instead of the right side, were shown. Muller's Topknot and the Norwegian Topknot are two rare Yorkshire species, as is also the Worm Pipe-fish, the smallest member of the family.

Several members of the Shark family were shown and discussed, including the Blue Shark, Porbeagle Shark, Piked Dog-fish and Lesser Spotted Dog-fish with its curious egg capsules.

Skates and Rays were represented by the Sharp-nosed Ray, the ' fair wind fish ' of the fishermen, who believe that if they catch one of these fishes they are assured a fair wind home. The Spotted Ray, Starry Ray, and Thornback Ray were also discussed.

The Myxine or Hagfish, called ' Borer ' by the local fishermen, is a degenerate form, possessing neither eyes nor fins. It has a suctorial mouth furnished with a single large hooked tooth, by means of which it attaches itself to other fishes, usually of the Cod family, and boring its way through the skin, lives inside the body of its host, feeding upon the flesh of its living victim.

The lecture was illustrated by eighty very beautiful coloured slides, illustrating most of the species dealt with, and also anatomical features and stomach contents. Several slides illustrating the elaborate development of the palate teeth and throat teeth were of great interest.

Mr. E. W. Wade referred to people being stung while wading in shallow water, when no doubt the Lesser Weever was responsible, and Mr. H. B. Booth asked if the Gurnards were not also poisonous, but was assured that there was no actual secretion of poison.

Mr. C. F. Procter, in moving a vote of thanks to the lecturer and lanternist, referred to Mr. Clarke's lucidity of expression, his beautiful descriptive slides, and to his happy inclusion of folk-lore and superstition.

CORRESPONDENCE.

PAINTING OF A GREY-LAG GOOSE.

Re Seton Gordon's 'Days with the Golden Eagle,' reviewed in your October issue, might I venture a few criticisms about the splendid painting by J. C. Harrison, facing p. 130, 'Golden Eagle striking a Grey-lag?' The goose depicted is not a Grey-lag, but more of a composite painting of three of our four Grey Geese, viz., Grey-lag, Bean, Pink-footed, and White-fronted! The plumage most resembles that of a Grey-lag, 'tis true, but this goose has most certainly not yellow legs and yellow beak with a black nail, as shown in the picture, nor are the head and beak heavy enough for a Grey-lag; moreover, I think the bird is altogether too small in comparison with the eagle for a Grey-lag. The goose is also too small for a Bean, and the wings far too blue, although the legs are of this species in colour, as also is the nail, but the rest of the beak is wrong in colour.

The size in the painting is more that of a White-fronted Goose, the legs and beak being also right for that species, but the nail is the wrong colour, and most of all, the whole markings on the face and forehead, together with the black bars on the underparts, as shown in the adult of this species, are absent. Except for the wings being too blue, the bird depicted nearest corresponds to an immature White-fronted in its first year in size and most other features, for I have shot such birds in which the tip of the nail has been black (as in sketch) and the base white. These remarks apply only to birds in a wild state.—H. W. Robinson, M.B.O.U., F.Z.S.Sc.

'MOTHER-DIE.'

Referring to Mr. Wattam's note on *Anthriscus sylvestris* Hoffm. in *The Naturalist* for December, the younger girls here often refer to almost any small white flower on a well-branched inflorescence as 'Mother-Die,' but they really intend *Anthriscus sylvestris* to bear the name. Some of them tell me that they would never, on any account, take this flower into the house, lest their mother should die. The superstition seems to be very strong. The girls, however, do not know the name 'Step-Mother's Blessing,' and I have never heard it for this plant, though this would be obviously only one step further in the fulfilment of the dreadful curse.—Mary Hewlett, Greenhead High School, Huddersfield, December 12th, 1927.

THE YORKSHIRE FLORA.

With a view to bringing the Flora of Yorkshire up to date, the Botanical Section of the Y.N.U. has decided to prepare a list of records of flowering plants and ferns which have been discovered since the publication of the Floras of the three Ridings.

To facilitate this work botanists are requested kindly to forward particulars of such plants to the recorder for the Riding concerned. These notes should, as far as possible, include the name of the discoverer of the plant, the date when it was found, and the precise locality. Particulars of fresh stations for the rarer plants will be equally acceptable.

Recorders :—

West Riding : W. Arthur Sledge, B.Sc.,
38 Kelso Road, Leeds.

J. Beanland,
12 St. Margaret's Road, Bradford.

North Riding : A. I. Burnley,
Stepney Drive, Scarborough.

East Riding : R. J. Flintoff,
Goathland, North Yorks.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

The Fifty-seventh Annual Report of the Libraries, Art Gallery and Museums Committee of Bradford records that 2500 postcards have been sold during the year, and 800 copies of the official handbook.

J. Selwyn Turner has a paper on ' The Lower Carboniferous Succession in the Westmorland Pennines,' and the ' Relations of the Pennine and Dent Faults,' in *The Proceedings of the Geologists' Association*, Vol. XXXVIII., Part 3.

The Fifty-sixth Annual Report and Proceedings of the Chester Society of Natural Science, Literature and Art have been issued, and contain the record of the 97 additions to the Society's Museum, and summaries of the reports of the various sections of the society's activities.

A record of the researches carried on by the *Scottish Marine Biological Association* at the Marine Biological Station, at Millport, for the year 1927, has just been published. An urgent appeal is made for increased membership in order that the staff may successfully carry on its work.

A portrait of the members taking part in the Hereford Foray, with an account of that excursion and a series of papers, etc., thereon, together with numerous other valuable monographs, many well illustrated, appear in Parts 2 and 3 of Volume XII. of *The Transactions of the British Mycological Society* issued a little time ago.

We have received *The Report of the Manchester Museum* for 1926-7, with details of its acquisitions and activities, and *Manchester Museum Publication No.* 94, which is a reprint of J. W. Jackson's paper on ' New Carboniferous Lamellibranchs and Notes on other Forms,' and contains descriptions of many Cumberland, Lancashire and Yorkshire species.

Part 4 of Volume XII. of *The Transactions of the British Mycological Society* keeps up the standard of excellence which we now expect. A. Lorrain Smith contributes a wonderfully complete account of ' Recent Lichen Literature,' T. Petch figures and describes ' *Septobasidium rameale*,' W. R. Ivimey Cook refers to the ' Influence of Environment on the Infection by *Ligniera junci*,' and Jessie S. B. Elliott contributes No. 4 of her ' Studies in Discomycetes.'

Volume XXVIII. of the *Leicester Literary and Philosophical Society's Transactions* contains the Presidential Address of Mr. A. T. Kerslake dealing with the ' Present Position of Education ' ; and there are also ' Structural Study of the Charnian Rocks and of the Igneous Intrusion Associated with them,' by F. Jones ; ' Notes relating to the Map of the Charnwood Forest,' by F. W. Bennett ; and ' The Adventive Flora of Leicester and District,' by G. J. V. Bemrose, as well as the reports of the various sections.

The Proceedings of the Zoological Society of London for 1927, Part II., contain, among many other memoirs, ' Reproduction of the Cælacanth Fish, *Undina*,' by Professor D. M. S. Watson ; and in Part III., ' The Skull, the Face, and the Teeth of Primates, with special reference to Dolichocephaly and the Centres of Growth in the Face,' by H. A. Harris ; and ' A Revised Classification of the Tetraphyllidean Cestoda, with Descriptions of some Phyllobothriidæ from Plymouth,' by W. N. F. Woodland.

We should like to congratulate Mr. C. B. Travis on the excellence of the *Proceedings of the Liverpool Geological Society* for its sixty-eighth session, 1926-1927. The Society's medal for 1927 was awarded to Professor P. G. H. Boswell, who has an account of ' Some Recent Work on the Petrography of Sedimentary Rocks ' in the volume. The Presidential Address by Mr. T. A. Jones deals with ' The Geological History of the Irish Sea Basin,' the other papers being ' The Geology of the Llanelidan District, N. Wales,' by R. C. Blackie ; ' Geological Notes on Spain and Majorca,' by M. S. Johnston ; and ' The Sources of the Old Red Sandstone of Anglesey,' by E. Greenly.

NEWS FROM THE MAGAZINES.

The Medical Herbalist for September includes 'Some Herbs of the Fylde,' by R. H. Walls; and 'Grass,' by A. Hall.

'Minerals as Museum Exhibits' is the title of a paper by Sir Henry A. Miers, D.Sc., in *The Museums Journal* for October.

A beautiful coloured plate of the Yellow-breasted Cissa is given with the December issue of *The Avicultural Magazine* for December.

The Avicultural Magazine for November has a well-illustrated article on 'Geese,' by the Marquiss of Tavistock and F. E. Blaauw.

H. E. Crabb writes on 'A Romance of Two Words, Ammonite and Ammonia,' in *The Australian Museum Magazine* for October-December, 1927.

W. S. Berridge discourses on 'The Wild Rabbit,' and 'W.P.' on 'How England learned to be kind to Animals,' in *The Animal World* for December.

From the *Archiv for Pharmaci og Chemi* for November we have received a reprint of Mr. Hans Schlesch's notes on 'Anvendes Snegle endnu af Laegfolk imod Hudlidelser m.m.?'

We learn from *The Medical Herbalist* for November, that the Wigan Botanical Society has had a Baby Show, and that the mothers received a good supply of Dr. Thompson's Slippery Elm Food.

The Editor, Dr. V. G. L. van Someren, contributes the two articles to No. 29 of *The Journal of the East Africa and Uganda Natural History Society*. These deal with the Butterflies and Birds of Kenya and Uganda. There are several illustrations.

Humberside, the annual magazine of the Hull Literary Club, recently issued, contains quite a number of poetic and other literary ventures by its different members, and Mr. Frank Noble Wood describes 'Peter-atte-See and the Lost Town of Ravenserodd.'

British Birds records that a Wigeon, ringed in Cumberland in September, 1920, was caught in the district of Ijma-Pelchora, North-east Russia, in May, 1926. The same journal records two Griffon Vultures over Ashbourne, Derbyshire, in June, 1927.

J. A. Smythe continues his record of 'Minerals of the North Country'; J. E. Hull has some notes on 'The Farne Islands and their Fauna'; C. W. and G. H. Harrison write on 'Fireflies and Glow-worms'; and J. Edmund Clark dilates on 'The Woes of a Phenological Committee,' in *The Vasculum* for November. There are also the usual valuable local notes and records.

Among the contents of *The New Phytologist* for December are 'Studies in the Ecological Evolution of the Angiosperms,' by J. W. Bews; 'The Behaviour of the Cyanogenetic Glucosides of Cherry Laurel during Starvation,' by H. Godwin and L. R. Bishop; 'Methods of obtaining Tracheal Sap from Woody Plants,' by J. P. Bennett, F. G. Anderson and Y. Milad; 'Synthetic Dyestuffs as Microscopical Stains,' by W. A. Silvester; and 'Symbioses and Asymbiosis Relative to Orchids,' by Lewis Knudson.

The Quarterly Review, one of the few serious literary productions which keeps up its reputation, still appears regularly, and is as interesting as ever. No. 493, which is before us, contains a dozen excellent essays, together with notices of recent books. One article which will particularly appeal to our readers is Professor J. Arthur Thomson's 'Animal Behaviour.' This is based upon recently published volumes on the subject, and, as we always expect from the pen of Professor Thomson, is a fascinating contribution. He gives no fewer than twenty conclusions as a result of his reading, the first of which is: 'By "mind in animals" we mean whatever in them corresponds in any degree to our own inner life of thinking, feeling and purposing; but we must be prepared to find that what is a powerful stream in ourselves is a very slender rill in many an animal.'

NORTHERN NEWS.

Dr. D. G. Hogarth, Keeper of the Ashmolean Museum, Oxford, has died in his sixty-sixth year.

Professor F. W. Oliver favours us with a copy of *An Outline of the History of the Botanical Department of the University College of London.*

From Mr. Hans Schlesch we have received an illustrated monograph, which has been printed in Riga, entitled *Zur Kenntnis der Molluskenfauna des Ostbaltikums mit Berücksichtigung der in Lettland vorkommenden Arten.*

The museum at Wilton Park, Batley, is to be officially named 'The Bagshaw Museum,' as a tribute to the memory of the late Walter Bagshaw, F.R.M.S., the founder of the institution, and Hon. Curator up to the time of his death.

We learn from the press that 'The late Alderman W. E. Pease, M.P., has left what is considered to be one of the best collections of birds' eggs in this country to the Darlington Museum.' What a lot of these 'best collections in the country' there seems to be nowadays.

The Lancashire Coalfield : *The Ravine Seam,* Part II., Carbonisation in Continuous Vertical Retorts, has been issued by the Department of Scientific and Industrial Research (vi.+37 pp., 1/6 net). The present report includes results of the investigation of the Coal obtained from the Bickershaw district.

The President of the Leicester Medical Society had to give an address to his medical confreres, and chose the subject of 'Evolution : An Outline of Modern Theory.' This has been published by Messrs. Simpkin, Marshall, Hamilton, Kent & Co., Ltd., (26 pp.) in convenient form at the low price of one shilling.

Mr. E. Cecil Curwen favours us with a reprint of his paper in *Antiquity* for September, dealing with 'Prehistoric Agriculture in Britain,' and certainly the photographs of various early cultivated areas, principally in the South of England, which he gives, are remarkable, and add a new chapter to archæological research.

On the kind invitation of the Director of the British Museum (Natural History) we visited that institution at South Kensington recently and saw the 'new case of London birds' there. It was an ordinary table-case in which the various species of birds occurring in London were exhibited, each mounted on its separate pedestal.

Dr. R. E. Mortimer Wheeler is to be congratulated on the first of the *London Museum Catalogues,* which is bound in cloth, well illustrated, contains 56 pages, and is sold at the low price of one shilling. It deals with London and the Vikings, and the wealth of material available is well shown on the numerous plates and blocks in the text.

The following appointments have been made by the principal trustees of the British Museum :—In the Natural History Museum : Dr. L. J. Spencer to be Keeper of Mineralogy, Dr. W. D. Lang to be Keeper of Geology, Mr. J. Ramsbottom, Deputy Keeper in the Department of Botany, Mr. M. A. C. Hinton, Deputy Keeper in the Department of Zoology.

The Slaithwaite Naturalists' Society has ceased to exist after a long and active existence. The reason for closing down is the lack of members. The library of books has been presented to the Slaithwaite Co-operative Society (Education Department), in whose room the society has met—when a meeting was possible. Several interesting natural history specimens have been presented to the Tolson Memorial Museum, Huddersfield, together with a collection of 260 microscopic preparations, principally of histological subjects. At the time of writing it has not been decided what to do with the very substantial balance of cash in hand. It is hoped that some degree of field and indoor work may be continued by the few in connection with the Education Department of the local Co-operative Society. A society called the Yorkshire Naturalists' Union could put the cash balance to good use.

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Demy 8vo, bound full cloth, containing 200 *pages and numerous illustrations. Price* 10/6 *net.*

This book reviews the drama in Hull and and District from the earliest times, paying particular attention to the performances of miracle plays. Although treating the subject from the local standpoint, the book forms a valuable historical record of the drama in general. In fact, at one time Hull had a theatre, holding 3000 people, that was second only in importance to that of Drury Lane, London. Beverley at one time boasted five theatres, and places like Patrington, Ottringham, Howden, Hedon, Bridlington, Driffield, etc., had their theatres and issued bills.

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NOTES AND COMMENTS.

PROFESSOR F. O. BOWER, Sc.D., D.Sc., LL.D., F.R.S.

The Yorkshire Naturalists' Union is fortunate in securing for its President, Professor Frederick Orpen Bower, one of the most prominent of British botanists. He was appointed Professor of Botany at the University of Glasgow in 1885, and has recently retired to Yorkshire, his native county. He was born at Ripon in 1855, and is the author of a large number of important botanical works of the first rank, some of which have reached two or three editions. Possibly the most striking of these was his wonderful volume on 'The Origin of a Land Flora,' published in 1908. In addition to his numerous contributions to botanical science, his genial presence at meetings of various learned societies has considerably added to his popularity. One can hardly imagine, for instance, what the Botanical Section of the British Association would be like without his presence, and an indication of the respect he holds there is shown by the fact that he has held the Presidency on three separate occasions, probably a unique record.

FISH LIKE POLISHED PEWTER.

The Daily Mail for December 8th gives the following interesting note, which might have been written by a sober scientist. There is also a good illustration. 'A number of Ray's bream—fish of the colour of polished pewter—have recently been found at many points along the east coast. Specimens have been reported in the past few weeks from St. Comb's, Aberdeenshire; from Yorkshire, where eight were found between Scarborough and Filey after the recent gale; and one at Withernsea; from Norfolk, at Holkham, Wells, and Happisburgh; and from Suffolk, at Lowestoft and Kessingland. Several have been found in the herring nets of drifters fishing from Lowestoft and Yarmouth, one fish brought to Lowestoft being 24 in. long and weighing 5½ lb. The true home of the Ray's bream is in the Mediterranean and Atlantic, and the North Sea has been entered at only rare intervals. In the opinion of naturalists, the present invasion has been by the north of Scotland.' The writer, however, has not escaped the hands of the Sub-editor, who has headed the note 'North Sea Invasion. Fish Like Polished Pewter'; personally we don't think they do!

YORKSHIRE NATURALISTS AT HARROGATE.

The 338th Annual Meeting of the Yorkshire Naturalists' Union was held in the Church Institute, Harrogate, on December 3rd, the President, Mr. W. Falconer, occupying the Chair. At the General Committee Meeting in the afternoon the Annual and the Treasurer's Reports were passed without discussion. At the evening meeting, Mr. Falconer gave his

Presidential Address on 'The Evolution and Survival of the Spider.' Votes of thanks were accorded to the President for his services; to Mr. Riley Fortune, who had been responsible for the local arrangements; and to Messrs. Amey and Cartmell, of the Harrogate Photographic Society, who manipulated the lantern. Ten new members were elected. The evening concluded with a display of lantern slides by Messrs. W. R. Grist, F. A. Mason, W. H. Pearsall, H. C. Versey and Riley Fortune.

CREATIVE EDUCATION.*

Most English naturalists, and especially those connected with our museum, have long been familiar with the extraordinary enthusiasm with which Dr. Henry Fairfield Osborn, of the American Museum of Natural History, has carried out his work. His name is one of the most prominent in the museum world. Notwithstanding his enormous amount of scientific work, and the many calls upon his time in the numerous capacities he fills, he has found opportunity to write 'Creative Education in School, College, University, and Museum: Personal Observation and Experience of the Half-Century, 1877-1927.' The volume contains portraits of many well-known scientific men, and a frontispiece which reads: 'The author, Roy Chapman Andrews, and Walter Granger, in the heart of the Desert of Gobi, on the scene of the great discovery anticipated by prolonged observations, imagination, research, and induction, and crowning the author's fifty years of research.'

BRADFORD ANTIQUARIES.

Dr. J. Hambley Rowe brings *The Bradford Antiquary* up to date by including in the last issue the Reports for the years 1922-26. W. E. Preston describes 'Rooley Hall and its Associations'; Rosse Butterfield 'An Incised Bronze Palstave from Wharfedale' (an illustration of which would have added considerably to the value of the record); W. Robertshaw on 'Adwalton Fair'; W. E. Preston on the 'Perambulation of the Boundaries of Stanbury, 1805'; and J. C. Hawley gives an 'In Memoriam' notice of W. Scruton, which is illustrated by a photograph and an amusing sketch.

A DERBYSHIRE RECORD.

The Journal of the Derbyshire Archæological and Natural History Society has now reached No. XLVIII., and we should like to congratulate the editor, whomever he may be, of the part recently issued. Naturalists will be interested in H. C. Hayward's notes on Lepidoptera; N. H. Fitzherbert's ornithological notes for the county, and shorter notes on alabaster carvings and mining matters in Derbyshire precisely three hundred years ago, and 'Cork' a lichen on Baslow Moor. There are historical and archæological papers relating to deeds, heraldry, effigies, bills, etc.

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* By Henry Fairfield Osborn. London: Charles Scribner's Sons, xiv.+360 pp., 10/6 net.

BRITISH MUSEUM ALMANAC.

The British Museum (Natural History), South Kensington, has issued an almanac for 1928. It has a coloured portrait of Daniel Charles Solander. The almanac also contains many interesting pieces of information; for instance, it states that 'Many important changes have been made in the Central Hall of the Museum. The statue of Darwin has been removed from the stairs to a position under the bridge facing that of Huxley, and the bronze statue of Owen stands in its place. The African Elephant Scene has been opened in a bay on the west side, and a case illustrating the remarkable Angler-Fishes placed in the centre of the Hall. The fine group of Spanish Ibex, presented by the King of Spain, stands on the bridge. The large fossil Elephant found at Upnor, Kent, has been erected in the Geological Gallery.' On the back are particulars of the staffs in the different departments, including the names of the Relief Gatekeeper and Lavatory Attendant. There is a list of the more important recent acquisitions, which include the Stebbing Collection of Crustacea; the Trechmann Collection of Minerals; and the Oberthur Collection of Lepidoptera.

BIOLOGICAL CLASSIFICATION.

Dr. F. A. Bather favours us with his Presidential Address to the Geological Society of London, dealing with 'Biological Classification, Past and Future.' He concludes, 'Though you have seated me in this Chair, I am as conscious as Canute that no *ex cathedra* remarks of mine will stem the tide of phylogenetic speculation, or prevent it from overwhelming more of our venerable landmarks. Certainly I do not wish to check the study of phylogeny, especially when it is approached by the sound inductive methods of our modern palæontologists. But I do urge the enthusiasts to consider very carefully whither they are going. After all, classification has its practical side, and the excessive fragmentation of genera does not, I submit, help the phylogenist any more than the morphologist. I would impress on our workers a sense of responsibility in altering systems and in giving new names. A name once published is irrevocable, a permanent addition to the labour of future investigators. Let us beware of adding needlessly to the burden of posterity.'

A NATURE LOVER'S DIARY.

Many of our readers will have been familiar with the 'Nature Lover's Diary,' appearing regularly in *The Yorkshire Post*. We do not know that we shall be out of order in stating that they have been written by our member, Mr. H. E. Wroot. In the column appearing in *The Yorkshire Post* for December 29th we regret to read the following :—' In consequence of the ever-growing pressure upon the space of *The Yorkshire Post*, and other circumstances, it is decreed that " A Nature Lover's Diary " must cease with this contribution. It has already watched the wheels of Nature go round during eight years, and the Diarist has a pleasant sense of gratitude to countless correspondents who have helped him to keep an eye upon the happenings in the biggest county in England. He feels himself especially enriched in the friendships which have been made through this weekly sharing of common pleasures.' Probably there is one person who will not regret this, and that is Mr. H. E. Wroot.*

ROSES, MARJORAM AND NETTLES.†

The publishers tell us that this book ' will appeal to old and young in all ranks of life. It is full of entertainment, of wit, and of wisdom, and is an ideal book for the table of study or boudoir, for the wayfarer's pocket, and as a prize or gift book.' The author tells us that ' This little book has been loved in the making.' There is an Index occupying 18 pages of persons and books from which quotations have been made. The volume itself begins on January 1st, and for each day there are a number of quotations bearing upon the day itself, or the person whose birthday occurred on that particular date. Thus, on January 1st, there are quotations from Chaucer, Shelley and the Children's Wassail Song, all dealing with New Year's Day. On January 2nd we learn that James Wolfe was born in 1726, and Jones of Nayland and Sir George Perley refer to his work. On March 23rd William Smith, Engineer and Geologist, was born in 1769. There are particulars of his work and an extract from his epitaph at St. Peter's, Northampton ; and so on.

THE MYSTERY PEARL SHELLS.

The above title is given to a pamphlet which can be obtained, free of cost, from Mr. E. A. Chapman, 69 Hayter Road, London, S.W.2. It seems that Mr. Chapman possesses four small mother-of-pearl shells, attached to each of which is a large pearl. Mr. Chapman speculates as to their origin ; for example he states, ' The home of the family was in a small seaside village. It may be a French or Spanish privateer had the misfortune to be wrecked near this part of the Irish

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* Since the above was in type, numerous protests by the *Yorkshire Post* readers have resulted in this feature being continued.

† By Adelaide L. J. Gosset. London : Methuen & Co., xxvi.+ 388 pp., 5/- net.

Coast, and that the shells were a gift from one of the rescued. This would, to some extent, explain their sentimental value. The fact that experts consider the shells of oriental origin leads one to suppose that they may have been appropriated, by some adventurer, from one of the Eastern Temples, and eventually brought to Europe, as were so many of the jewels used in ancient religious imagery.' Mr. Chapman evidently attaches great importance to the specimens, and gives photographs, measurements, etc., etc., of them, and contends that no one yet has been able to tell him what they are. We have had submitted to us a pamphlet entitled 'A Short History of a Notable Irish Family,' illustrated by the arms of Hugh Roe O'Donnell, Chief of Tyrconnell, beautifully emblazoned. The pamphlet is by P. C. Gallagher, formerly Professor at the University College, Black Rock, Dublin, and is written by request of Ernest A. Chapman, in further explanation of the booklet entitled 'The Mystery Pearl.' There is a poem on O'Donnell Abu ; a Foreword pointing out the important part played by H. R. O'Donnell, and five pages of matter relating to the achievements of the said O'Donnell. There is also an illustration of 'The Mystery Pearls' : For full particulars see publication entitled 'The Mystery Pearl Shells,' though we do not quite see that the pamphlet helps the question of the 'pearls' much. As the author himself states 'there are so many sources from which the great O'Donnell could have obtained these Mystery Pearls.'

BRITISH ASSOCIATION REPORT.

We should like to congratulate the Secretary and all concerned in the production of the Annual Report of the British Association for the Leeds Meeting during the same year as that in which the meeting was held. For a quarter of a century we have been suggesting the desirability of this, but were assured that it could not be done. However, the 'impossible' has happened, and the present writer for one is grateful if for no other reason than that he will only have to make his bibliography slips out for 1927 instead of, as in previous years, for the year of the meeting and also for the year of the Report. While the Presidential Address and many of the abstracts, etc., are in type at the time of the meeting, there is, of course, much to be written up relating to the meeting itself, to its various committees and their recommendations, in addition to which, as in the case of the present writer's address to the Conference of Delegates, new matter has to be put into type after the meeting, then the whole has to be indexed and seen through the press, and what is perhaps rather a serious matter in the way of delay, binding. Notwithstanding all this, copies were sent out during the early

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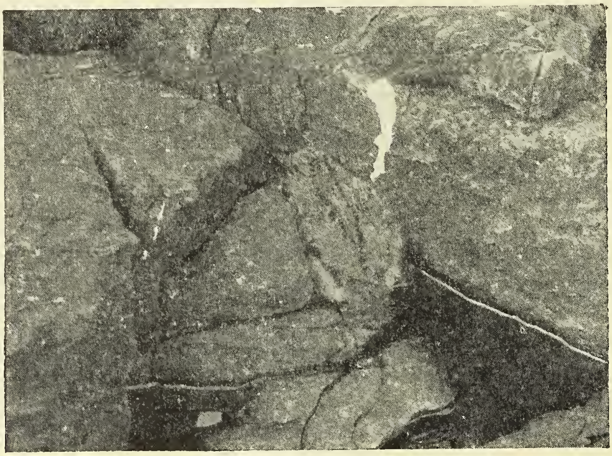
part of December. The volume contains about 500 pages, and can be obtained from the Secretary, British Association, Burlington House, London, W.1.

THE BABY BIRD AND ITS PROBLEMS.*

In the present work, the author professes to interpret the simple observations of a field naturalist in the light of the principles of elementary biology. He endeavours to illustrate the relation between the structure or equipment of a bird, its habits, and the surroundings in which it lives ; for to these last, in some degree, the life of every bird is a response. These remarks are supplemented by a wonderful series of photographs from his own camera. The book deals principally with young birds, and is published in the hope that it may interest young readers, boy scouts, girl guides, and the like. It is, therefore, written in a language suitable for the young naturalist, printed in large type, and the illustrations of birds' eggs, nests, and young, are all of merit. As an example of protective colouration we reproduce a block from the photograph showing a young Oystercatcher hiding among rocks.



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The Book of the Golden Eagle, by **C. W. R. Knight.** London : Hodder & Stoughton, xii.+296 pp., 21/- net. The advent of the cinematograph has probably enabled more people to see the wonders of bird life than has all the books ever published. Possibly among the most popular of the films appearing on this subject are those prepared by Captain C. W. R. Knight, which must have been seen by tens of thousands of people. The present volume contains a wonderful series of reproductions of photographs from Mr. Knight's camera, together with suitable letterpress, in large type, apparently for young readers.

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* By W. Bickerton. London : Methuen & Co., xvi.+135 pp., 10/6 net.

THE EVOLUTION AND SURVIVAL OF THE SPIDER.

WM. FALCONER, F.E.S.

(Continued from page 14).

Spiders, then, in following the course which led them away from insects have themselves diverged along two main lines of development into a web-making race of sedentary spiders which patiently await the entanglement of insects in their nets, and a non-web-making race of species which seize their prey by guile or violence, or actively pursue it. The result has been such an immense variety of modifications and adaptations in accordance with this evolutionary divergence that every possible kind of habitat receives its qualified tenants, and every district is in consequence enabled to maintain the maximum number of species and individuals. The hunting spiders have learnt to know exactly where to strike in order to kill their victims instantly, otherwise they might themselves on occasion be in danger of losing their lives. Such knowledge is unnecessary to the web-makers. They can enswathe their victims in their silk, and a bite anywhere will suffice to quieten them without actually killing them, in which case their juices will probably remain sweet and fluid for a longer time, and therefore more palatable. Those spiders which have adopted the arboreal habit have a short, high and swollen abdomen ; an adjustment to confined spaces (*e.g.*, *Theridion*). A modification of the same type, and less pronounced, exists amongst those kinds which favour low vegetation (*e.g.*, Linyphiidæ). All these are web-makers. In ground-frequenting forms the abdomen is of a different shape. In some it is wide and flat, as in the vagrant ‘ crab-walkers,’ (Thomisidæ), which can move backwards, forwards or sideways with equal ease and celerity, and can insert themselves almost anywhere. In others the abdomen is longer and more cylindrical, some of them being hunters built on slimmer lines to offer the least amount of resistance to their rapid passage through the air when hunting or fleeing. Neither they nor the ‘ crab-walkers ’ construct snares. Others are tube-dwellers with or without a web attached, the body and the abode being thus adapted to each other.

The racial divergence, again, has not been without its effect on the eyes and their efficiency. Their number, size and position are definite for each species, and as no two of the six or eight which spiders normally possess have the same line of vision, and all are fixed and simple, no combined focussing is possible. Sight, nevertheless, is very weak in the orb web-makers, which depend rather on the sense of

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touch recognising vibrations communicated to them along threads held in their feet. So delicate is this sense of touch that they can discriminate between the commotion set up in the snare by an entangled fly and that caused by the wind, or one due to the appealing tug of a wandering male. The complete telegraphic system thus provided by the web compensates them for the weakness of sight, which would otherwise be a serious drawback to them as animals of prey. The hunters (wolf and jumping spiders) naturally have the keenest sight, because they depend solely on it to discover and seize their prey. To help them in this their range of vision has become greatly extended—forwards, sideways and even upwards, by means of eyes set on the top of the head. This enlarged visual field also enables them to perceive their enemies sooner, and they are further protected by numerous hairs and bristles on the body and limbs which are sensitive to the slightest stimulus. In the extremest case, the ability to see does not extend to a greater distance than about one foot* when nothing intervenes.

Two kinds of eyes have been produced, each with its own appropriate function. In one they are round, hemispherical and dark coloured, for diurnal use ; in the other flattened, pale coloured or white, and not always round, being sometimes oval or angular, for nocturnal use. In those spiders at large during the day, all the eyes are of the diurnal type, *e.g.*, Lycosidæ, Attidæ, and Thomisidæ ; in those active during the night all are of the nocturnal kind, *e.g.*, the British six-eyed spiders, Dysderidæ and Oonopidæ. Usually, however, there is a mixture of both sorts, the commonest arrangement being one of six nocturnal eyes and only the middle front pair diurnal. These visual adaptations are thus seen to be in strict accordance with their mode of life, the great majority concealing themselves during the day and becoming active during the darker hours.

Amongst spiders there are varying degrees of maternal care, which in some may cease with the deposition and safe bestowal of the eggs. On hatching out, the young, being unable to eat, remain together for a short time in or near their birthplace. Those of *Epeira diademata*, always lacking a mother's care, gather together into a little ball in the midst of a labyrinth of lines which are so many avenues of escape. In *Pisaura mirabilis*, the mother spins a special tent for their reception, and there guards them. Two extremes. With the first moult, the disabling membrane, which aforetimes enveloped their mouths, is removed, and whether they have had a mother's care or not, according to species, they begin life on their own account, but with such a disposition as that of the spider—quarrelsome, suspicious of everything, without thought for anything except its own needs, together with the difficulties it must surmount to supply them—there is only one kind of life possible for it, a solitary one. The swarming young, now needing food, and being liable under pressure of hunger to attack from each other, cannot remain indefinitely together, and are impelled to disperse as soon as possible to a greater or less distance from their nursery, and are scattered far and wide into suitable habitats. To effect this dispersal they have developed the ability—extraordinary in creatures unprovided with wings—to make aerial flights. The intending aeronauts—there is no concerted action, although many may rise at the same time because of the favourable conditions—choosing a fine day and a gentle breeze, climb up to some elevated point such as the top of a post, gate, bush or grass stalk, straighten their legs, raise their abdomen until it is upright or nearly so, and pay out three or four threads which are drawn out to a considerable distance by the air-currents. As soon as they feel sufficient pull on the threads they loose their hold and fly off from their station, back downwards. The duration and length of the flight are largely determined by the wind, yet they are not altogether helpless passengers, being able to haul in their lines with their feet, or extend them according as the breeze rises or falls. Small species fly at all ages, especially in spring and autumn, but large ones only as juveniles, for when adult they become too heavy. Considerable numbers are often arrested in their flight by some obstacle—walls, railings, hedges, etc.—and individuals similarly are found dangling from a hat brim or crawling on the face. It is obvious, too, that the same thread-projecting method will enable them to escape from marooned situations when, if it had been otherwise, they could not.

---

* Males of Attids—Experiments of Mr. and Mrs. Peckham.

It is not possible to over-estimate the influence which the need for self-preservation and the acquisition of food unmolested has had not only on the bodies, but also on the habits and instincts of spiders. This is very noticeable in the protective measures which they have elaborated against race extinction either by reason of physical vicissitudes or organic foes. The number of eggs now laid by the various species has reference to the past and present exigencies of their mode of life and situation. In those living openly, and thereby exposed to more and greater dangers, a large output up to several hundreds in British, as in *Epeira quadrata* and *diademata*, and thousands in exotic forms, not necessarily in one envelope, has become the rule; if in concealment more or less effectual, the risks being minimised or absent in con-

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sequence, a much smaller number down to six, as in *Ero*, or two in each sac, as in *Oonops*, the latter, however, constructing several such. In every instance the eggs, many or few, are sufficient to cover all contingencies of loss and to ensure the continuance of the species.

Although the sum total of eggs deposited every year is enormous, the agencies and agents of destruction with which spiders have to contend in every stage of their existence are so many and formidable that only a small proportion of them survive to complete their life cycle, the greatest waste taking place in the egg-state and among the young from unavoidable causes against which no provision is possible—storms, floods, heavy rain, landslides, earthquakes, accidents while migrating and moulting, the unceasing and extensive encroachments of man upon the uncultivated tracts where they find the most congenial homes, and devouring ground fires, accidental or intentional. They have, however, accommodated themselves variously to the periodicities of the year. Their 'seasons' and length of life are not all the same, so that according to species, they pass through the winter as eggs—in which state extremes of temperature affect them least, or as juveniles, or as adults. Great cold may benumb the living forms, but they do not hibernate in the true sense of the word. Nor is it necessary they should, because of their innate fasting capacity, reserve stores of fat, and the presence of tiny living creatures in their chosen winter retreats.

With the progress of time the living foes of spiders have also become more and more fertile in resource, more and more dangerous and expert in assault, and now surpass them in size, strength or agility, or in all combined, are more formidably armed, impenetrably covered or furnished with wings and able to swoop down upon them unexpectedly from above. Insectivorous animals of every description make no distinction between them and insects; social and solitary wasps in different ways utilise them as food for their grubs, ichneumon flies parasitise their bodies and their eggs, and the larvæ of certain mites drain their juices. Spiders, too, because they fill the same niche in Nature and eat the same kind of food, are placed in direct competition amongst themselves for the main necessary of life. This mutual pressure, not so tangible as an embodied assailant, is just as effective in reducing their number, because, being of carnivorous habits, the antagonism it engenders vents itself in cannibalistic attacks upon their neighbours. Thus circumstanced, and with comparatively ineffective weapons of offence, and their poison innocuous to their larger and more destructive foes, it is not surprising that they have been compelled to resort to guile and camouflage for protection rather than to put any reliance on the strength and effect of their defensive armament. Naturally they have not all solved the problem of personal safety in the same way, nor yet by means always different from those employed by other animals which have been subjected to the same influences. I propose, therefore, at this point to condense some of my remarks. The arboreal species, by elevating themselves above the ground out of the reach of earthbound assailants; the trap-door spiders by concealing themselves in the ground; and the largest British wolf spider (*Trochosa cinerea* Fabr.) similarly by hiding in a tube beneath the cover of a stone amongst the shingle of the river bed, where it is often submerged at flood times for a considerable period; the water spider, after having become a terrestrial animal, by returning to the under waters and making its permanent home there; and other species by accustoming themselves to live in buildings of various kinds, or driven by circumstances into seeking shelter in dark, moist caves, where they have adapted themselves to the special conditions obtaining there, or as permanent and unmolested guests in ants' and moles' nests have resorted to habitats which restrict the risks of life and the competition for food and foothold with advantage to themselves, their eggs and their offspring. The same ends are subserved by the nocturnal life so prevalent amongst them, and a habit of the closest concealment during the day amongst vegetation, and in various situations on the ground under some kind of cover, supplemented by external schemes of coloration and markings which tend to merge them with their accustomed surroundings. Thus rendered inconspicuous, many need only remain motionless, trusting to be overlooked or mistaken for something else. If more active—wanderers over walls, tree trunks or over the ground and sandy places—their protective tints render them much less evident, although in some instances for ultimate safety they must depend on their quick appreciation of the danger and their speed of foot (*e.g., Clubiona, Lycosa*).

Some of the sedentary orb web-makers, when on their snare and fearing an attack from a bird, or when an unexpected shadow falls upon them, vibrate themselves on a thread with such speed that they form mere indistinct blobs. The bird, startled or not knowing where to strike at such an uncertain mark, becomes confused, and flies off without molesting them (*e.g., Meta merianæ* Scop.). A British spider, grey-green in colour, and with an elongated body (*Tetragnatha extensa* Linn.), presses itself close to a twig or stem of the plant on which it resides, stretches out its long legs, four forward and four backwards, and remains quite still, conforming sufficiently to the details of its habitat as to be un-

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detected. One of another family (*Tibellus oblongus* Walck.) elongated too, but straw coloured, does the same, more especially amongst the similarly hued marram grass on the coast dunes, and is as easily overlooked. But for lack of time, examples from foreign lands of a more perfect simulation in colour or appearance or behaviour of some inedible natural object about them, such as bark excrescences, twigs, falling bright green and faded leaves, dewdrops, etc., might have been cited.

Another expedient general amongst them, but shared in by some other lowly creatures, is to sacrifice some part of their body rather than lose their lives altogether. In the case of spiders it is a leg when actually held by an assailant. The imprisoned limb is voluntarily thrown off, and by its vigorous twitchings, continued for some time, holds the attention of the attacker until the menaced spiders make their escape otherwise unharmed. The leg is not completely lost, but is renewed, if not always perfectly, with the next moult. Many kinds, when alarmed, suddenly drop down on a thread, and this action, simple as it seems, often saves them when everything else fails. Bates, for example, in his well-known work, states that of all the refugees which swarm up trees in an unavailing endeavour to avoid destruction by vast columns of marching ants, in Central America, the spiders, by suspending themselves on threads in the air, alone escape death.

That most remarkable adaptation of a weaker, more edible, more defenceless and less numerous animal taking advantage of some other creature's (ant or beetle) or thing's immunity, for some reason or other, from attack to secure personal safety by imitating its appearance, and, what is more essential still, its manner and actions, is also met with amongst spiders. Most animals are wary of ants because of their numbers, dauntless courage and pugnacity ; hence to resemble them somewhat in form and manner, and live in similar places as some spiders do, is to be safe from attack by other creatures to which ants are distasteful as food, or too formidable as foes ; but those species (*e.g.*, *Thyreosthenius biovatus* Cb. and *Evansia merens* Cb.), which have taken up their abode as guests in the seclusion of ants' nests, do not assume the myrmecoid form, being sufficiently protected by their situation. There are some remarkable instances of such insect resemblances abroad ; for example, in Cuba,* but in this country the few which occur are much less pronounced both in form and colour. A traveller in Java has made known to the world a resemblance of quite a different type, which, while primarily a device for obtaining food, has, doubtless, a protective value as well, the victim and the enemy being alike deceived. The spider in question (*Ornithiscoides decipiens*) weaves upon a leaf an irregular patch of silk and lies down in the midst of it on its back, the whole then forming an excellent imitation of a bird's dropping, and seizes the butterflies, which for some unexplainable reason choose to alight on such excreta. The resemblance was so perfect that the traveller, though fully aware of the artifice, was deceived on other occasions also.

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* Slides made by permission from *Trans. Ent. Soc.*, December, 1926, Plate XCIII.

Sufficient proof has now been given that spiders possess a very high degree of animal as distinct from human intelligence. Nor could this have been otherwise, for their evolution was mental as well as physical. The one was dependent on the other, only an advance on the physical side making possible any improvement on the mental, but every new combination when effected struck always an even balance between structure and function. Thus the diverse habits and complex instincts which now distinguish spiders owe their inception and growth to an ever-developing bodily organisation which prepared the way for still higher mental powers and more extended spheres of existence. In previous forms of the Arthropoda, the nervous system consists of ganglia of nerve matter situated respectively in the head, chest and abdomen, and connected by a double thread, but in the spider the nerve substance is concentrated into one central mass in the forepart of the body, forming a kind of brain from which nerves are carried to all parts of the organism. This concentration, however, has one great disadvantage, as it renders spiders more vulnerable to the attacks of their enemies. One stab in the proper quarter either kills them outright, or when scientifically and accurately inflicted, merely paralyses them, as in the case of the solitary wasps, which drag them in this comatose state to their cells, holes or burrows to serve as living food for their grubs after they have hatched out.

Within the tiny compass of this brain lie the secret springs of the many-sidedness of the spider, its resource in the time of difficulty and danger, its cunning and sagacity excelling those of its victims, and its adaptability to every circumstance of its lot ; but, to prevent misconception, it is necessary to add that the whole fabric of its mentality is based on instinct rather than on any higher attribute, however much some of its manifestations may seem to savour of intelligence. This but enhances the wonder of its achievements. Spiders are the only animals which have produced an appliance to intercept the airy flight of insects. As a race they long ages ago solved the problem of aviation on the heavier than air principle, a feat which man has only very recently accomplished;

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and the raft spider with an appliance, and some of its relatives without, that of traversing water either on the surface or beneath it. Spiders not only enlist the aid of the wind in ballooning and in escaping from water isolated situations, as has already been mentioned, but also in projecting the foundation lines of their webs across spaces which are sometimes astonishingly wide. In all thread-projecting operations they stand head to the wind to prevent entanglement with their silk. The water spider in its own way discovered the principle of the diving bell, and how to fill it with air by the downward displacement of the water which at first it contained, in much the same manner as the modern chemist collects his gases. The lid which closes the burrow of the trap-door spider has bevelled edges so that it will fit tightly, is provided with a hinge so that it will shut and open easily without displacement, and is carefully planted with vegetation from the ground around it and becomes indistinguishable. The tenant with fangs and claws will hold the door against an enemy seeking to enter, and in the case of those with ' wafer lids ' will, if this be forced, retreat to a lateral cul-de-sac concealed behind a flush door. The orb web-makers utilise a natural law to effect the formation of the sticky globules of their snares. As the spiral line is being spun, they apply to it special tubes on the posterior spinners and coat it evenly with a gum which does not solidify in contact with the air. As soon as the portion in any sector is fastened to a spoke, the spinner with one of her feet stretches it and then suddenly releases it, as is done with the string of a bow. The matter then, in accordance with the laws governing surface tension in liquids, resolves itself into a series of minute beads. The tanging is done to hasten their formation. These spiders again give consideration to the wind when choosing sites for their snares. When it is strong, they construct them on the sheltered side, when it is gentle, on the topmost parts of bushes to avail themselves of what breeze there is. By observing these details, a fair indication of the direction and force of the wind at the time they were under construction may be obtained. Individuals amongst them have been known to weight their webs with a little stone or piece of wood to give them greater steadiness when the wind is more than ordinarily strong. A few ambushing spiders at home and abroad consciously, as it were, ensconce themselves in those flowers and lichens to whose tints their own protective coloration most nearly approximates, *e.g.*, *Misumena vatia* and *Philodromus margaritatus*, both British species.

Judging from these and other incidents in their lives in which they seem to be aware of what they are doing, spiders must be credited with possessing a certain amount of mental plasticity. Nevertheless, there is no evidence that they have furthered in the slightest degree the modifications, developments or adaptations, which have arisen from time to time in the course of their evolution, by any conscious effort, deliberation or foresight of their own. On the contrary, it would appear from a material point of view that they have been moulded into what they have become by the varying, testing and sifting of an organism, unwitting it may be, but nevertheless responsive to the formative pressure of the natural forces, physical and organic, to which it has been subjected for untold ages.

Although my subject is by no means exhausted, even in the limited sense I proposed to deal with it, I have now arrived at a point where I may conveniently conclude my remarks. My endeavour throughout has been to show that spiders merit the high systematic rank which they hold amongst the lower creation because of the extensive specialisation and concentration of their bodily structure combined with the greatest physiological efficiency, and that it is this intimate cooperation between organisation and function as manifested in their habits and instincts, and produced in them by evolutionary processes, which has ensured their survival and established their race dominancy, and will continue to do so.

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Monarch Butterfly at Huddersfield.—On November 26th last, Mr. C. Cameron, of Lepton, presented to the Huddersfield Museum a fine example of *Anosia plexippus*, which he captured on Kirkheaton Tip in the afternoon of September 17th, 1917. Its capture was so vaguely reported at the time that it was considered prudent not to include it in the Lepidoptera report for that year. This handsome North American species, which variously goes by the names of the Monarch, Black-veined, Brown or Milk-weed Butterfly, is peculiar on account of its annual migratory movements on the North American Continent, and also from the fact that it has succeeded in reaching and establishing itself both in the Pacific Islands and Australia to the west of its original region, but also it has progressed eastwards across the Atlantic to Madeira and the Canary Islands, where it is now so permanent and common. There is a specimen in the South Kensington Natural History Museum, taken in Glamorgan in 1871, the first recorded for Europe. Since then it has occurred a number of times in this country, but, as yet, does not seem to have maintained itself. This Huddersfield example seems to be the most northern record yet made of the species in Britain.—B. MORLEY.

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Waxwing near Goathland.—I saw a fine Waxwing yesterday near Goathland Station, Yorkshire, feeding on hawthorn berries.—W. S. Medlicott, December 27th, 1927.

Little Auk in East Yorkshire.—While motoring from Kelleythorpe to Garton-on-the-Wolds (near Driffield) during the north-east gale on Boxing Day, Mr. and Mrs. Chatterton found a Little Auk squatting on the road alive and apparently uninjured, but exhausted. They brought the bird back to Driffield, but their efforts to revive and feed it were unsuccessful as it was dead the next morning.—E. B. Burstall, Hull.

Hawk Moths at Scarborough in 1927.—Despite the bad weather conditions, Sphingid Moths have been somewhat common in the Scarborough district in 1927. Eyed Hawk Moth (*Smerinthus ocellatus*).—This species seems to be becoming commoner than it was in the late A. S. Tetley's time, who records, in the Lepidoptera Record-book of the Scarborough Field Naturalists' Society, ' I have never seen or heard of its being taken here.' Besides a specimen recorded in 1924, a male was brought to me from Gristhorpe in June, and on August 3rd, Mr. T. Stainforth and I took the ova on *Salix* in How Gill, above Robin Hood's Bay. This is a late date for the ova. (On the same day, ova of the Puss Moth (*Dicranura vinula*) and Sallow Kitten (*Cerura furcula*) were also taken—also much behind their usual time). Death's Head Hawk Moth (*Manduca atropos*).— A fine specimen was brought to me on September 3rd, and another specimen was reported in early October. Convolvulus Hawk Moth (*Sphinx convolvuli*).—This was common during September and October. I have had brought to me at least half a dozen examples, from Weaverthorpe to the coast, and a number of others have been reported. Two females laid eggs, which failed to hatch, being probably sterile. Small Elephant Hawk Moth (*Chærocampa porcellus*).—This is not common in the district. A specimen was brought to me from the Racecourse in June. Large Elephant Hawk Moth (*Eumorpha elpenor*).—A male was brought to me from Cayton in June, and larvæ were brought from Flixton, Seamer Carr and the Racecourse. This moth seems to have been not uncommon in the larval stage in the county this year. Other Hawk Moths recorded during the year, but calling for no special note, are the Poplar Hawk Moth (*S. populi*) and the Humming-bird Hawk Moth (*Macroglossa stellatarum*).—Geo. B. Walsh, Scarborough, 10th December, 1927.

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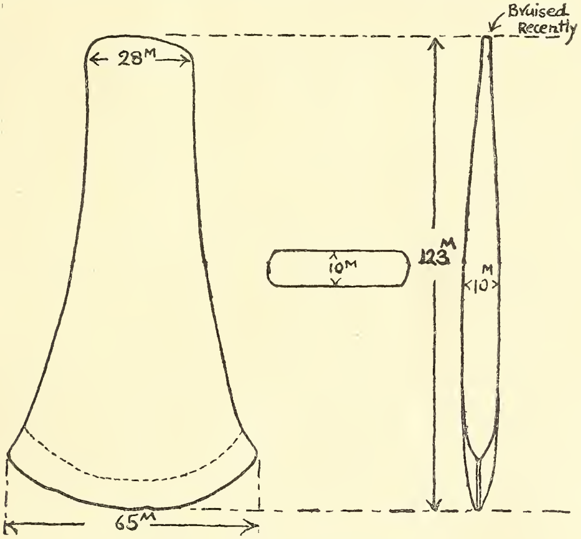
The Entomologist's Monthly Magazine for January contains ' Crabronidæ in an old Oak stump, Wollaton Park, Nottingham,' by H. P. Jones ; and ' Notes on Westmorland Corixidæ,' by G. E. Hutchinson.

BRONZE AXES FROM EAST YORKSHIRE.

T. SHEPPARD, M.Sc.

We have recently obtained an early type of Bronze Axe, found at Patrington, E. Yorks. It has a thick, apple-green coloured patina, with no stop ridge or any trace of ornament, and measures $4\frac{3}{4}$ inches in length, has a cutting edge $2\frac{3}{4}$ inches long, and weighs 10 ozs. This is No. 149 in the Hull Museum Collection, and is one of the earliest forms we possess.

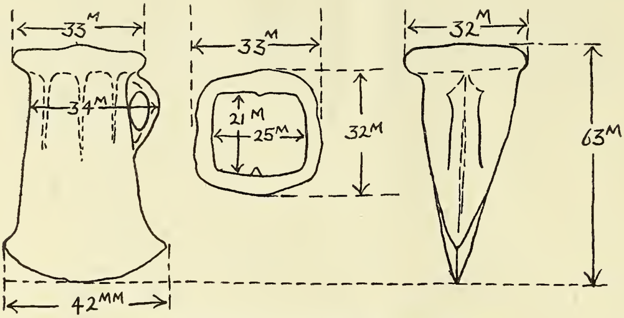


Bronze Axe from Patrington.

A few days ago, at Thornton Dale, near Pickering, an exceptionally small socketted axe was found by Mr. J. Green, and sent to the Museum at Hull, where it now is. Among the dozens of socketed Bronze Axes in this collection only two are of smaller size than the average type. One of these is from Lowthorpe and measures $2\frac{3}{4}$ inches long, 1 inch wide, and has a cutting edge of $1\frac{3}{4}$ inches, with slight trace of the usual three ridges on the sides. The other is from Sproatley, and measures $2\frac{1}{8}$ inches long, $\frac{3}{4}$ inch in width, with a cutting edge of $1\frac{1}{2}$ inches. The latter was part of a large hoard of axes found at Sproatley some time ago, which consisted of several socketed axes of the ordinary type, a single palstave, and this diminuative example, which has no trace of a ridge on the sides.

The specimen from Thornton Dale is midway in size between the Lowthorpe and Sproatley axes, and measures 2 inches long, 1¾ inches wide, and has a cutting edge of 2 inches, and weighs 3½ ozs. Except for its small size it is similar in type to the ordinary socketed axes. It is No. 150 in the Hull Museum Collection.

The illustrations have been made by Mr. A. L. Armstrong, and a copy has been sent to the British Association for its record of Bronze Age implements.



Bronze Socketed Axe from Thornton Dale.

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Pauropus huxleyi Lubb. in Derbyshire.—While searching for Collembola beneath the loose bark of a fallen willow tree, in the meadows near Bakewell (Derbyshire), I was fortunate in coming across a number of specimens of this curious and not very common 'myriapod,' which I do not think has been reported previously for Derbyshire.—James M. Brown, 176 Carter Knowle Road, Sheffield.

Paulinella chromatophora Laut. near Sheffield.—In *The Naturalist*, 1915, p. 157, I described the structure of this very elegant Rhizopod, and gave an account of its known distribution in England. At that time it was only known in this country from specimens which I had dredged from some of the lakes and tarns in the Lake District, and, in fact, only one living example had been observed. Recently, while examining the micro-life in the sediment taken from a farm pool at Meersbrook (Sheffield), on the Yorkshire-Derbyshire boundary, I came across abundance of living examples. All previous specimens have occurred in *large* bodies of *clear* water, while in the present case the water was anything but clear. All the individuals I observed possessed two chromatophores, and as is usually the case, the cytoplasm seemed to enclose no ingested food-bodies, the animals appearing to be holophytic in their method of nutrition.—James M. Brown, Sheffield, 18th January, 1928.

INSECT PESTS IN YORKSHIRE GARDENS.

G. C. JOHNSON.

THE year 1927 had at least one advantage in that it was on the whole unfavourable to insect life, with the result that comparatively little damage has to be recorded. In view of this it is not without interest to notice the insects which have been able to cause damage, and also those which have been reduced in number by the weather or some other factor. Observations on the commoner fruit and vegetable pests are appended.

COLEOPTERA.—Apple Blossom Weevil, *Anthonomus pomorum* L., was collected at Howden. In some years the damage in this district by this weevil is considerable ; owing to late frost destroying a good deal of the flower an estimate of the damage by weevil is impossible. Clay-coloured Weevil, *Otiorrhynchus picipes* Fab., has been seen in many districts ; damage by the adults has been noted at Roundhay, Garforth, and Harrogate. Black Vine Weevil, *O. sulcatus* Fab., was collected at Howden and Harrogate ; damage by this weevil to crops under glass was considerable, but less than usual. Raspberry Beetle, *Byturus tomentosus* Fab., was common in all districts, and the damage appeared to be about as usual. Turnip Flea Beetles, *Phyllotreta nemorum* L., and other species gave much trouble on light land in the East Riding. The dry period early in the growing season probably accounted for this ; in the West Riding the damage was less than usual. Pea and Bean Weevil, *Sitones lineatus* L., caused much damage in all districts. The adults started to feed early in the season and continued late ; in addition to damage on peas and beans, clover suffered considerably.

HEMIPTERA.—Aphis attack on all cultivated fruits was below average. *Aphis pruni* Koch. caused much damage to Plum and Damson in all districts. *Aphis malifoliæ* Fitch. did much damage in small gardens at Airedale above Castleford. Capsid Bug, *Plesiocoris rugicollis* Fall., was less prevalent than usual ; a bad attack of this pest was seen at Holme Moor, East Riding—the host was Black Currant ; the Apple crop received less attention than usual in all districts. Carrot Aphis, *A. carrotæ* Koch, was common in all districts, but coincided with a bad attack of Carrot Fly, *P. rosæ* Fab., and it was, therefore, difficult to estimate the aphis damage. Judging by the condition of the Carrot foliage the aphis damage must have been considerable. Grey Cabbage Aphis, *A. brassicæ* L., was only seen as isolated colonies ; it was seen in most districts, but no damage can be recorded. White Fly, *Aleurodes vaporariorum* Westw., was present in all districts, but in less numbers than usual.

LEPIDOPTERA.—'Winter Moths,' *C. brumata* L., *H. defoliaria* Cl., and *A. æscularia* Schiff., did not cause any serious damage. Tortrix larvæ were not abundant on cultivated fruits. Raspberry Stem-bud Moth, *Lampronia rubiella* Bjerk., was common in the larval stage in many districts ; this insect is very local, common in one garden, and absent in another only a short distance away. A feature of the season was the large number of Gold-tail larvæ, *P. similis*, in the East Riding, and at Barnby Dun, Doncaster. Hawthorn seems to be the usual host of this moth, but in districts where hawthorn and fruit trees grow near each other, much damage was done to the latter. I notice that if a lone rose tree is growing in a hawthorn hedge it is often defoliated by this species. During late summer many colonies of the young larvæ were noted on Plum, Apple and Pear foliage, and unless some factor intervenes the pest promises to be prevalent in 1928. Codlin Moth, *Cydia pomonella* L., was as usual local. Many, however, were seen in the village of Osgodby, East Riding. Cabbage Whites were scarce. *P. brassicæ* have been difficult to find. *P. rapæ* was more common, especially the second brood. Perhaps the very few *P. rapæ* present were due to a large percentage of the hibernating chrysalids being parasitized by the Chalcid, *Pteromalus puparum* L. Out of fifteen pupæ collected from the roof of a shed at Osgodby, East Riding, in February, 1927, Pteromalus emerged from fourteen. The Garden Pebble, *Pionea forficalis* L., was more common than usual in all districts ; damage to all brassicas was severe. *Hadena oleracea* L. was very common, and was noted feeding upon sugar beets, potatoes, and peas. *Hydræcia micacea* Esp. has been found mining in the stems of potatoes ; the larvæ of this species was found in this position at Harrogate, Huddersfield, Bradford, Barnsley Sheffield and Doncaster. I have only seen *Plutella maculipennis* Curt. once or twice last season, and then only isolated specimens.

DIPTERA.—Pear Midge, *Diplosis pyrivora* Riley, was not seen during the period under review. Carrot Fly, *Psila rosæ* Fab., as noted above under Hemiptera, this pest was common, very few sound carrots were obtained in the whole of the West Riding. In the East Rdiing, where carrots are grown on a larger scale, things were not quite so bad, but even so the damage was considerable. Onion Fly, *Hylemyia antiqua* Meig., was local in attack, but on the whole less than normal. Cabbage Root Fly, *Chortophila brassicæ* Bouche., did not cause serious damage, probably because the wet weather allowed the attacked plants to recover. As usual the root-flies caused most trouble on light land. Celery Fly, *Acidia heraclei* L., was conspicuous by its absence.

HYMENOPTERA.—Apple Sawfly, *Hoplocampa tesudinea* Klug was not seen during the period. Pear Sawfly, *Eriocampa limacina* Cameron was found at Holme Moor, East Riding ; the larvæ were feeding upon wall pears. This pest does not seem common in Yorkshire. Gooseberry Sawfly, *Nematus ribesii* Scop., was not common, but isolated cases occurred where total defoliation occurred, *e.g.*, Castleford district, West Riding.

NEMATODA.—The presence of *Hetrodera schachtii* Schmidt. was noted in many districts on potatoes, and in one case on tomatoes. Wherever found a poor potato crop was the result. Potato Eelworm is common, but often the attack is confused with Potato Leaf Curl.

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Parasites on Agriotes in Yorkshire.—When collecting the larvæ of *Agriotes* at Osgodby, Selby, on 9th July, 1927, I found two specimens with the pupa stage of a parasite protruding through the skin of the dead larvæ. These pupæ were white, but a day later they turned black. The parasites emerged on 13th July, two males and seven females. Pairing took place on 15th July. I am indebted to Dr. J. Waterson, Natural History Section, British Museum, for kindly identifying the specimens as *Paracodrus apterogynus* Hal. Dr. Waterson informs me that he has only had *Paracodrus* sent to him once before, and then it came from Mr. A. W. Rymer Roberts in 1923, from material collected in Sussex ; the host was *Agriotes obscurus*. In all probability *A. obscurus* was the host of these Yorkshire specimens, but of this I am not certain.—G. C. JOHNSON, The University, Leeds.

Corbicula fluminalis at Paull, E. Yorks.—In drawing attention for the first time to the occurrence of *Corbicula fluminalis* in the East Yorkshire gravels, the late Sir Joseph Prestwich recorded it in the Glacial Mound at Paull.* Ever since, careful search has been made by Hull and other geologists, and a wealth of sections at Paull has enabled this possible. On several occasions members of the Hull Society have made a determined effort to find this species, but have failed. While its occurrence in such profusion so near as Kelsey Hill and Burstwick made its absence at Paull a matter of surprise, the Hull members came to the conclusion that Sir Joseph Prestwich must have been mistaken in his identification. During the past few days, however, a visit to the Gravel Beds near Paull Holme revealed a single and perfect valve of *Corbicula fluminalis* to Mr. W. H. Crofts, thus confirming Prestwich's early record.—T.S.

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* 'On the Occurrence of *Cyrena fluminalis*, together with Marine Shells of Recent Species, in Beds of Sand and Gravel over Beds of Boulder Clay near Hull ; with an Account of some Borings and Well-sections in the same District.' *Quart. Journ. Geol. Soc.*, Vol. XVII., pp. 446-456, 1861.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

In a dozen pages *The Report of the Laura Spelman Rockefeller Memorial* shows how no less a sum than nearly seven million dollars was distributed during 1926 among various institutions ranging from universities to girl scouts and the Salvation Army.

The Report of the Colchester Museum for 1927 contains a portrait of the late A. G. Wright, for twenty-five years the curator of the Museum. Among the many reeords of additions there were ' more than ten cart-loads of Antiquities from Dr. P. G. Laver.'

The Annual Reports of the Woolwich Council of Social Service for 1925-7 have been published together, and contain a wonderful account of the good work being done with the enthusiastic assistance of Mr. C. H. Grinling. At present there are between six and seven hundred associates, and an appeal is made to increase this to at least ten thousand.

Among the many contents of the ever welcome *Annual Report of the Smithsonian Institution* just to hand are ' The Loess of China,' by G. B. Barbour ; ' Geography and Evolution in the Pocket Gophers of California,' by J. Grinnell ; ' How Beavers build their Houses,' by V. Bailey ; ' The Mosquito-fish (*Gambusia*) and its relation to Malaria,' by D. S. Jordan ; and ' Fragrant Butterflies,' by A. H. Clark.

Just before the close of the year we received the Palæontographical Society's Volume LXXIX., issued for the year 1925, and containing parts of four important and well-illustrated monographs. These are on ' The Gault Ammonites,' by Dr. L. F. Spath ; ' The Macrurous Crustacea (including Yorkshire Specimens),' by H. Woods ; ' Palæozoic Asterozoa (including Westmorland examples),' by Dr. W. K. Spencer ; and ' Dendroid Graptolites,' by Dr. O. M. B. Bulman.

The Proceedings of the Isle of Wight Natural History Society for 1926 (Vol. I., Part 8) have been issued by the County Press, Newport, Isle of Wight, at 3/-, and form an exceptionally interesting number, Besides Lists of Mosses, Hepatics, Bird Notes, Phenological and Meteorological Records, and Natural History Notes, there are three papers on ' The Roman Villas ; ' Flint Arrow-Head Types,' and ' Notes on the Base of the Chloritic Marl, all relating to the Isle of Wight. The illustrations of the flint arrows in the Isle seem to be of the type fairly common throughout the country.

The Transactions of the Lincolnshire Naturalists' Union for 1926 were issued in due course, and contain reports of the recorders of the various sections, and an account of the Union's field meetings. C. H. Caton Haigh gives ' Bird Notes, Autumn, 1926 ' ; H. Preston writes on ' Geology ' ; and Rev. Sumner C. Wood gives his Presidential Address on ' Place-names on the Map of Lincolnshire in relation to Natural History.' There is an account, with portrait, of George A. Grierson, the twenty-second President of the Union ; H. W. Miles writes on ' The Agricultural Entomology of the Holland Division of Lincolnshire,' and altogether the publication is admirable.

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The Spoilers, by **J. H. Fabre.** London : Hodder & Stoughton, 287 pp., 7/6 net. In this fascinating series of essays, the great French naturalist describes the destructive work of insects, the histories of which are well known, and of considerable importance economically on account of the great damage they do to old buildings. Timber of various descriptions in its natural state and when made up in furniture, crops of corn, fruit, and so on, are also dealt with. A perusal of the volume impresses one very much of the importance in the world of little things.

THE YORKSHIRE NATURALISTS' UNION'S ANNUAL REPORT

FOR 1927.

(Presented at Harrogate, December 3rd, 1927).

The Sixty-fifth Annual Meeting was held at Leeds on Saturday, December 4th, 1926, and a brief account of the Proceedings appeared in *The Naturalist* for February, p. 63. The Report was published in the same journal, commencing on p. 15 of the January issue.

The Presidential Address of Mr. Edwin Hawkesworth, entitled ' Sixty-five Years of Yorkshire Geology,' was printed in the issues of *The Naturalist* for January, February, March and April.

Field Meetings have been held during 1927 as follows :—Hayburn Wyke (April 16th-18th), Grassington (June 4th-6th), Allerthorpe (July 2nd), Sedbergh (July 30th-August 1st). The excursion proposed for Bradshaw Dyke, on September 10th, was cancelled for reasons given in Circular No. 337; and failure to obtain permission to visit the moors on that date makes it very desirable to select moorland excursions in the shooting season only *after* permission has been obtained. A Fungus Foray was held at Stamford Bridge during September 17th-22nd. Section meetings were held by the Entomology Section (including the Plant Galls Committee), at Buttercrambe Woods, June 8th ; the Botany Section (Bryology) at Slaithwaite, November 12th ; the Conchology Section at Askern Bog, June 11th, and at Wheatley Fish Pond, Doncaster, July 9th. Reports on the work of all these meetings have appeared or will do so in the pages of *The Naturalist*.

The Union greatly appreciates the work of its Local Secretaries, whose efforts to secure suitable accommodation at excursion centres are met with greater difficulties each year. The Executive desires especially to acknowledge its indebtedness to Mr. J. Hartshorn for his services in North-west Yorkshire, and to express the wish for his speedy recovery from the illness which prevented his attendance at Sedbergh, and which has persisted through the autumn months.

The Excursions for 1928 will be as follows :—

N.E. Stokesley, April 7th-9th.
S.E. Hull for Spurn and Kilnsea, May 26th-28th.
Mid. W. Austwick, June 16th.
S.W. Huddersfield for Holmbridge, July 7th.
N.W. Richmond, August 4th-6th.
Fungus Foray.—August 25th-30th.
Annual Meeting.—York, December 8th.

Membership.—The numerical strength of the Union remains normal, although the number on the Members' List shows a reduction owing to the removal from the register of names of members in default with subscriptions. Members elected during the year have slightly exceeded resignations, while the obituary list is regretfully heavy. A newly revised list of members was published in the issue of *The Naturalist* for June in response to the wish of the Executive. Certain omissions, errors in address and changes of address since that date are as follow :—

1917. L. Brotherton, Col. Sir Edward A., Bart., J.P., LL.D., The Hall, Roundhay, Leeds.
1893. Peake, Rev. E., M.A., Bluntisham Rectory, St. Ives, Hunts.
1924. Whitehead, H., B.Sc., 62 Brudenell Mount, Leeds.
1925. Woodcock, A. J. A., M.Sc., F.E.S., Clifton Manor, York.
1890. P. Woodhead, T. W., Ph.D., M.Sc., F.L.S., Technical College, Huddersfield.

CHANGES OF ADDRESS.

Clarke, J. E., B.A., B.Sc., 41 Downscourt Road, Purley, Surrey.
Fryer, Dr. J. Hy., Vézelay, Bardsey, Leeds.
Marsden, W., A.M.I.M.E., St. Andrews, Northumberland Road, New Barnet, Herts.
Chadderton, Tom, Clough Park, Greenfield, W. Oldham.
Cleveland Naturalists' Field Club : Hon. Secretary, M. Odling, M.A., B.Sc., F.G.S., Cherwell, Marton-in-Cleveland.
Leeds Naturalists' Club : Hon. Secretary, Geoffrey A. C. Herklots, B.Sc., The University, Leeds.
Watts, Rev. A., F.G.S., Yewtree Villa, Tuffrey, Gloucester.

The following is a list of members elected during 1927 :—

Atkinson, E., 268 Wakefield Road, Bradford.
Bamford, Wm., 70 Kent Road, Harrogate.
Bromehead, C. E. N., B.A., F.G.S., Geological Survey Office, York.
Carline, G. R., F.R.G.S., F.R.A.I., Bankfield Museum, Halifax.
Eustice, Miss Viola, B.Sc., 30 Lea Street, Lindley, Huddersfield.
Evans, E. D., Settlebeck, Sedbergh.
Groocock, Miss H., B.Sc., 7 Gill Street, Saltburn.
Howell, Kenneth G., 50 Woodside, Burley, Leeds.
Kilby, Miss Ruth, Clifford, Boston Spa.
Law, Miss Ida V., 4 Wilton Street, York.
Parkin, Mrs. Edith (W. H.), 31 Bradford Road, Shipley.
Raw, Wm., M.B.O.U., Whitfield House, Goathland.
Stubbs, F. J., The Museum, Oldham.
Wilson, Walter, 261 Manningham Lane, Bradford.

The Affiliated Societies have been augmented by the Settle Naturalist and Antiquarian Society and St. Peter's School Scientific Society. The Hon. Secretaries of these societies are Mr. Thomas L. Frankland, Langcliffe, Settle, and Mr. A. Wentworth Ping, M.A., St. Olave's, Clifton, York, respectively.

Obituary.—The losses this year through decease include those whose names and work will always remain associated with Yorkshire natural history and scientific attainment in branches of biological knowledge. In Memoriam notices have appeared in *The Naturalist* during the year :—J. H. Ashton, Walter Bagshaw, J. Darker Butterill, George Taylor Porritt, James Fraser Robinson.

The Presidency for 1928 has been offered to and accepted by Emeritus-Professor F. O. Bower, D.Sc., F.R.S., F.L.S.

The Honorary Secretariate.—The Executive welcomes the return of Dr. W. H. Pearsall, F.L.S., after his absence in America, and gratefully acknowledges the services of Mr. F. A. Mason, F.R.M.S., upon whom has devolved the secretarial duties during 1927.

General Committee.—The following members were elected Permanent Members of Committee :—Ralph Chislett, H. Foster, W. J. Forrest, A. Wentworth Ping, W. A. Sledge, and Rosse Butterfield.

The Naturalist :—During the year difficulty has arisen with regard to *The Naturalist* as a result of the lack of contributions. Whether this is due to the increasing number of other journals or to the lack of papers as a result of the deaths of some of the older members of the Union, it is difficult to say. The fact remains that frequently at very short notice it has been necessary to produce matter for publication, and this will account for there being a rather larger proportion of articles relating to the East Riding than otherwise would have obtained. An editorial appeal for 'Field Notes,' which, after all, seem to be the more generally interesting, has been successful, and we should like to take this opportunity of asking members of the Union to send to *The Naturalist* particulars of important new records, as without doubt the primary object of the journal is to record work being done in the North of England. Our members should look upon *The Naturalist* as the organ for recording their work. It is not complimentary to them, nor to *The Naturalist*, occasionally to see particulars of important finds being sent to other journals published elsewhere.

British Association :—Your delegate, Mr. T. Sheppard, had the privilege of taking the Chair at both the Conferences of Delegates of the British Association held at Leeds. On one of these occasions he had been requested to read a paper on 'Nature Reserves in Yorkshire,' and the Association has paid him the compliment of printing his address *in extenso* in its Annual Report. Other papers given were 'Blakeney Point as a Nature Reserve,' by Professor F. W. Oliver, and the Presidential Address, by Sir Francis Ogilvie ; 'The Protection of Wild Flowers,' by Sir George Fordham ; 'The Preservation of Geological Sections of Historical Interest,' by Professor H. L. Hawkins, etc.

Soppitt Memorial Library.—The only publication received during the year is the Annual Report and Transactions of the Manchester Microscopical Society for 1925-6, with an address by Dr. J. S. Thomson on the 'Auditory and Static Organs of Animals.'

Cardiff Naturalists' Society.—At the Diamond Jubilee Celebration of this Society on November 2nd, the Union and its journal, *The Naturalist*, were represented by Mr. T. Sheppard. An expression of thanks for this delegation has been received from the Hon. Secretary, Dennis H. Morgan, F.C.A. An account of this conference appears in *The Naturalist* for December.

VERTEBRATE ZOOLOGY COMMITTEE.

North Riding (W. J. Clarke, F.Z.S.) :—During the past twelve months it is pleasant to be able to record an increase in the numbers of several species. In the Scarborough district, Landrails, which had become very scarce in recent years, were heard and seen in somewhat greater numbers. Bullfinches were more in evidence in the woods, and about the harbour. The Kittiwake is now one of the commonest gulls to be seen there. In the neighbourhood of Whitby, Stonechats, House Martins and Sanderlings have been noticed in greater numbers than usual.

On the other hand, certain species have been seen in decreasing numbers. About the Scarborough district Greenfinches have appeared in smaller numbers than usual, while the Corn Bunting, once common, has now almost disappeared. The Chiffchaff, Sedge Warbler, Yellow Wagtail, and Nightjar are reported as less abundant than usual in the Whitby district. Partridges are very scarce all over the area under consideration, while on the coast no Common Scoters have been seen. Goldfinches are less abundant at Scarborough, but more so about Whitby. Crossbills have occurred in some numbers, especially in the Whitby district. Hawfinches are reported as fairly numerous about Whitby and two pairs of Pied Flycatchers nested in the same district. A Black Redstart paid a visit to Whitby in December, 1926, and was seen on two occasions. A Blue-throated Warbler, possibly the same bird seen on previous occasions, reappeared in its old haunts on February 1st, and remained there until April 30th, being seen almost daily during that period. Herons maintain their numbers throughout the area in spite of constant persecution. Two Red-necked Grebes appeared at Whitby last winter, and single specimens of the Grey Phalarope were seen at Scarborough and Pickering during November, 1926. Two

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Gannets are reported as having been killed by oil at Whitby in July, 1927, although this danger to bird life seems now to be considerably less in evidence along the coast.

Black-headed Gulls are still persecuted at their nesting place on Foulsyke, and a new colony has been formed on another part of the moor. A Little Gull in mature plumage has been seen at Whitby since early August up to the time of writing (October 18th). Sandwich Terns have appeared during the autumn migration in somewhat greater numbers than usual. Fulmars were rather less in numbers in the Whitby district, where at least one pair were observed to breed this year ; in the Scarborough area they appeared in their usual numbers and nested. More pairs were inhabiting the Castle Cliff during the whole of the season, but no young birds were actually seen there. A Stormy Petrel flew on board a fishing boat on November 4th, 1926, and was brought to me alive ; it was afterwards released.

West Riding (H. B. Booth, F.Z.S., M.B.O.U.) :—A Rough-legged Buzzard, obtained on Ickornshaw Moor, near Cowling, on October 25th, 1926, and an adult Cormorant on Leeshaw Reservoir, on April 19th, were both presented to the Keighley Museum (R. Butterfield). A Lesser Spotted Woodpecker was seen in Lister Park, Bradford, by Mr. M. Malone, on December 14th. Three Kingfishers were killed in one week by a cat in September, near Gargrave (—. Dufty, per R. Butterfield).

Owing to the mild and open winter of 1926-7, two Redshanks spent the winter here, for the first time to my knowledge. I first noticed them on December 18th, and they remained until the local breeding Redshanks returned in March. They spent their time chiefly between the Ben Rhydding sewage beds and the River Wharfe, and did not behave like a pair. Three Herring Gulls (two adults and one in the last stage of immaturity,) also spent the winter with us, but later I discovered it was not from the same cause. They were usually in a ploughed field, and later I investigated a manure heap in the corner of this field on which were the rotting entrails of some sheep. They were by no means friendly disposed to one another, and one would hold the manure heap against the other two, exactly as boys play 'Cock of the Midden,' in spite of the fact that it was closely surrounded by Rooks and Starlings, to whom it paid no heed. On January 30th, after bad weather on the coast, there were twelve Herring Gulls in this same field, but the next time I passed there were only the faithful three, who 'stood by' until early in April.

The spring and summer of 1927 has been one of the coldest and wettest that I ever remember. The early immigratory birds were rather late in arriving, but those due to arrive later were about up to date. The Swifts, for instance, a few birds arrived on April 30th, and the remainder during the first week in May. But I fear they have had a bad time. I have paid a good deal of attention to the Swifts, and to the period that they have remained with us in past years.

Hitherto I have invariably found that in fine summers, when winged insect food has been abundant, they have departed early ; but in poor, wet and cold summers their departure has been later and delayed. This year has proved the exception. They left quite a week before their usual time. I don't believe they were able to capture sufficient food to rear their young, and when the latter died, and they still found it difficult to procure food, they left for their winter quarters. On enquiry, I found that neighbouring colonies had left about the same date.

I first missed the Ben Rhydding colony of Swifts on August 12th, and did not see any afterwards. My attention was at first drawn to their absence by the presence of House Martins around my house. Is there any antipathy between the House Martins and Swifts ? It is a curious fact that since the Swifts have increased here we have not any House Martins. But there is a very large colony on a farm on the moorside within a mile from here. Each year, immediately after the Swifts have left, we have several House Martins around and above the house for the first time that year.

The shortage of winged insects must have had a deleterious effect on such birds as the Nightjar, Spotted Flycatcher, the Swallow tribe, etc. I have heard of three young Cuckoos being found in an exhausted and starving condition.

NESTING NOTES.—A pair of Grasshopper Warblers have nested this year near Broughton (R. Butterfield), and another was heard at Austwick on June 11th (C. A. Cheetham). Capt. J. H. Preston thinks there were rather fewer nests in the Eshton Heronry than last year. They again nested in the Lord Wood at Flasby. The Green Woodpecker is certainly extending its breeding area, more particularly in the upper valleys of the Aire and Wharfe. This year I found my first Curlew's nest on April 30th. It contained four eggs, which I judged were slightly incubated, but I had not any means of testing them.

On May 22nd I found another with four young chicks just hatched and hatching, and on the same day came across another nest laying up, with three eggs absolutely fresh ! ! I have reason to believe that there is still a small colony of nesting Lesser Black-backed Gulls somewhere in the hills near the source of some of our rivers, by birds of this species being seen during the breeding season, just as when they were nesting at Malham. I shall be very glad of any information that would lead to a proof of it next year.

THE CROSSBILL INVASION OF 1927.—From what information I can gather, this invasion was very little in evidence in the West Riding, excepting at the extreme south-western border, viz., at Greenfield (see *The Naturalist*, 1927, pp. 275 and 299). Mr. R. Butterfield reported a small flock in Grass Woods, Grassington, in July, and Mr. C. A. Cheetham sent me word that there had been a few, and that one had been shot by mistake at Austwick, near Clapham, in July.

I have made enquiries around, and have kept a good look-out myself, but without success. It is curious that the few Crossbills noted in this Riding, during the present invasion, should all have been in the western part of it !

VARIATION IN COLOUR.—Mr. Rosse Butterfield informs me that a cream-coloured Song Thrush has frequented the Elam Wood, near Keighley, this summer. Also that another cream-coloured Song Thrush was found dead near Skipton. The colony of Pied Blackbirds, frequently reported by Mr. F. Rhodes, in Lister Park, Bradford, continues and develops.

Mr. J. Astin tells me that on September 26th he saw there a Blackbird that was almost completely white. Early in September a very beautiful bird settled down in the upper part of Baildon Village, much to the delight of the inhabitants. It was at first reported in the press as a Bohemian Waxwing—a rare straggler to our shores. I had no difficulty in recognizing it at sight as a male of the Red-crested Cardinal (*Paroaria cucullata*), a native of South America, and obviously an escape from some aviary. It still remains, and Mr. D. Seth-Smith (Director of Mammals and Birds at the London Zoological Gardens), informs me that it is a hardy species and should not mind the cold weather.

East Riding (E. W. Wade, M.B.O.U.) :—In 1927 the usual course of the season seems to have been reversed, the winter being open and mild, with but little frost and snow, while in the latter part of May severe cold was experienced. July was a sunless month, with much rain. August and September were the wettest on record, with a minimum of sunshine. Stimulated by the fine weather in February and March, the early birds commenced breeding sooner than usual. Herons were laying in February, and young half grown by April 9th. Rooks commenced laying by mid-March, and the earliest young were hatched by 1st April, as early as any recorded hereabouts. On the 27th March Thrushes were all well advanced in nesting, nine nests, of which six had sitting birds, being seen on that date. Partridges commenced laying by mid-April, and the first hatching took place on 1st June. Later on the young Partridges were killed by the wet, and the season is the worst since 1879. Wild Pheasants were sitting on the 9th April. Razorbills were laying on the 1st May. After this the stimulating effect of the open winter spent itself. Colder weather followed and checked the birds' activities. In early May the Rooks were attacking chicks and eggs owing to drought, and later the cold weather made the warblers exceptionally late. The Corvidæ, apart from the Rooks, were normal, and Owls, owing to scarcity of mice, below the usual average. A Brown Owl was feeding young on Blackbirds and Thrushes. Marsh lands in one district were dried up, and wading birds in consequence scarce and late in breeding.

At Spurn the watcher reports fewer migrants visible than he can remember. No doubt the birds passed on without alighting owing to the mild and open weather.

The Warblers, with the exception of the Willow Warbler, were scarce, and the cold weather made them late in nesting. The common Whitethroat and Turtle Dove were noticeably scarce. A few pairs of Woodwrens made their appearance in mid-May, and at once commenced to nest.

The average date of arrival of our migrants was up to date, most of them appearing together on the 8th May, but the cold weather after arrival made them very backward in nesting. Blackcap and Garden Warbler were not nesting till mid-June. The Goldfinch is extending its breeding range in East Yorks., a new breeding locality being observed. Swallows and Martins were up to the average. no such scarcity as observed in Hungary being visible here, and were double brooded. Swifts are rather scarcer than formerly, and this year exceptionally late in nesting. The bulk of them did not leave till after the 1st August. On the 14th August in many villages the full numbers were hawking about as usual. The last bird was seen on the 11th September. In destroying Sparrows' nests it was discovered that the breeding period extends from April to September. Many broods of young being found on the 12th September.

It is satisfactory to note that in Holderness we saw a little of the enormous migration of Crossbills which has invaded the country this year, a few birds having been at Kilnsea from the 11th July to the 17th September. The number observed varied from three to eight, probably indicating more than one rush across the North Sea. The later birds included one male, the earlier one being all in green plumage, showing that the usual course of migration was followed, the young birds appearing first. They were observed feeding in the hedgerows, presumably on insect food, as the hips and haws were untouched. On previous migrations the birds have been seen to feed on Greenfly.

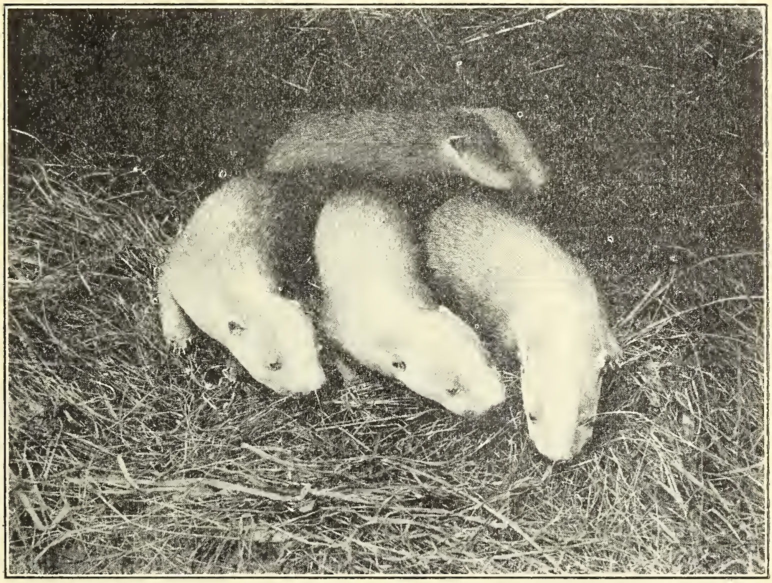
The depredation of the Herring Gull among eggs of Guillemot and Razorbill are becoming more serious each year. The bird is increasing, and the protection should be withdrawn from it. The increase of the Fulmar, though it undoubtedly drives the Guillemots from their ledges, is a small matter compared to the destruction wrought by the Herring Gull. If the Kittiwake and Herring Gull increase at the present rate, the Guillemot will certainly decrease year by year. The Kittiwake pushes it from its best ledges, and the Herring Gull destroys eggs and young wholesale.

A young Heron, a bird of this year, was caught destroying a young Pheasant in the beginning of July at Hornsea, and paid the penalty with its life.

(*To be continued*).

NEW NATURAL HISTORY BOOKS.

From the House of Constable & Co. five volumes have simultaneously appeared from the pen of **Mr. Ernest Thompson Seton,** and each is issued at 7/6 net. (1) **The Book of Woodcraft and Indian Lore** (xxiii.+567 pp.) contains a series of articles which have previously appeared in different magazines, dealing with subjects likely to be of interest to young people, especially those occupied in the Scout movement. The first chapter refers to The Principles of Scouting, and this is followed by The Purposes and Laws of the Woodcraft Indians ; Honours and Degrees ; Songs, Dances and Ceremonies ; Programs ; Signalling ; First Aid, etc. Then there are chapters on Natural History, with practical illustrations for stuffing birds ; Birds ; Toadstools ; Trees, etc. The volume is made especially interesting by the addition of over 500 drawings and sketches by the author. (2) **Rolf in the Woods** (xv.+437 pp.) illustrates the adventures of a Boy Scout with Quonab and Little Dog Skookum, and in this are many exciting stories of adventures with animals in the woods, and here there are over 200 illustrations. (3) **Animal Heroes** (362 pp.) is very similar in type, and contains stories of The Slum Cat ; Homing Pigeon ; Wolf ; Lynx ; Jack-rabbit ; Bull-terrier ; and Reindeer. (4) **Two Little Savages** (552 pp.) recounts the Adventures of Two Boys who Lived as Indians and What they Learned, with over 300 drawings. Here are lessons in archery, building huts, wigwams, meanings of various signs and symbols, and other things to delight the young reader. (5) **Monarch, the Big Bear,** gives stories of footprints and the adventures of a bear which seems to have had a very crowded life. **Gladys Davidson** writes for children **Queer Beasts at the Zoo** (72 pp.), and **Queer Birds at the Zoo** (76 pp.), both illustrated by Dorothy Burroughes, and both published



Young Badgers.

From 'The Lure of the Countryside.'

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by Messrs. G. Allen & Unwin, Ltd., at 2/- net. The authoress has made a selection likely to interest young people. The first book describes the Porcupine, Great Ant-Eater, Giraffe, Armadillo, Rhinoceros, Kangaroos and Wallabies. The second deals with Penguins, Ostrich, Toucan, Pelicans, Secretary Bird, Flamingo, and Owls. **The Lure of the Countryside,** by **William Coles Finch.** London : C. W. Daniel Company, 325 pp., 21/- net. The writer of this book has kept a diary of his country rambles for very many years, and has now made selections therefrom and reproduced them, together with photographs of the places visited, of the birds, flowers, streams, mills, and so on. The field covered is a large one, and the book is, as the author describes, a 'pot pourri of scenes and sounds reminiscent of the countryside.' Living in Kent, his chapters are largely of interest to a southerner, although there is much that will appeal to a naturalist wherever he may be situated. In the book, the block reproduced on page 61 is entitled 'Where's Mother?' **What Tree is That?** by **E. G. Cheyney.** London : D. Appleton & Co., xvi.+185 pp., 6/- net. The dedication 'To Those who know no Botany and yet would know the Trees' gives a hint as to the nature of the book. The pages are mostly so divided that an outline and illustration of a typical leaf and fruit occur on the left, and facing it, the description. The common and scientific name, Leaves, Bark, Range, Fruit, and Use, with an occasional additional note, are the headings. There is a good Index Chart at the beginning describing the different kinds of leaves. **The Ramblings of a Bird Lover,** by **Charles E. Raven.** London : Martin Hopkinson & Co., xvi.+186 pp., 10/6 net. Canon Raven tells us that 'the book has been written at odd moments and for the joy of it, and with no ulterior motive except the hope that something of that joy may be passed on. Interest in birds is spreading rapidly.

Ravens at Home.

From 'The Ramblings of a Bird Lover.'

Everywhere among younger people one meets those who know much and desire to know more. For such folks it may be an encouragement to see how a comrade spends his holidays, to realise that all around us are haunts of bird life, and to form plans for using spare time in a pursuit which is open to all, and which, more than any that I know, brings lasting refreshment and ever-new delights.' The chapters are exceptionally well written, and the illustrations are all from the author's own camera, one of which is reproduced herewith. **First Lessons in Nature Study,** by **Edith M. Patch.** London : Macmillan & Co., xii.+287 pp., 5/-. This is a useful gift book for a young reader, printed in large clear type, with simple words specially chosen, and with illustrations, principally of American interest, the authoress being in the Department of Entomology at the University of Maine, Orono. The chapters deal with Sugar, Milk and Animals that Feed it to their Young ; Seeds ; Meat and Hunters ; Hunters that have Backbones ; The Cotton Plant and Some of its Relatives ; Flax and Some Other Fibre Plants ; Spinners ; Fur Coats and Animals that wear them ; Feathers and Animals that wear them ; Caves and Dug-outs ; Buildings of Stone and Other Earthy Stuffs ; Travelling Homes ; Houses of Wood. There is also a chapter on Questions and Exercises.

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CORRESPONDENCE.

PROPOSED CENSUS OF OCCUPIED NEST OF HERONS IN GREAT BRITAIN IN 1928.

Dear Sir,

We are proposing, through 'British Birds,' to make a census of occupied nests of Herons in Great Britain in 1928. I enclose a rough proof of a schedule we shall be issuing in the next number of 'British Birds,' a copy of which we shall be pleased to send to any of your readers. We should be extremely obliged if you would do anything you can to assist us in this matter through the readers of *The Naturalist*. We shall require every possible help to get a complete census, and we are most anxious to make it complete, so that every helper we can get to make a census of only one heronry, even if it contains only one nest, will be a great advantage.—Yours sincerely, H. F. Witherby. 326 High Holborn, London, W.C.1.

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The Journal of Botany points out that certain biological journals and abstracts and *The Botanical Gazette* are dropping all capitals to specific names, but *The Journal of Botany* will continue to use the capital.

B. T. Somerville and H. E. Wroot (*Nature*, No. 3029) draw attention to the fact that the plan of the Devil's Arrows given in the British Association Handbook for Leeds is inaccurate, and that these arrows do not form part of a circle, but are ' actually almost in alignment.'

With *The Irish Naturalists' Journal* for November is issued a title page and index to Volume I., upon the completion of which we should like to congratulate all those responsible. C. B. Moffat describes the Irish Hare, a species which he states in absolutely unknown out of Ireland. Oddly enough he points out that the Isle of Man possesses the Irish Stoat but the English Hare.

According to *Nature*, ' The inaugural meeting of the Geological Society was held on November 13th, 1807, " for the purpose of making geologists acquainted with each other, of stimulating their zeal, of inducing them to adopt one nomenclature, of facilitating the communication of new facts, and of ascertaining what is known of their science, and what remains to be discovered." ' We are relieved to find that nomenclature was a problem a hundred and twenty years ago !

NORTHERN NEWS.

Mr. J. Cryer's herbarium has been secured by the Leeds University.

Mr. W. R. Grist has been elected President of the Leeds Naturalists' Club and Scientific Association.

The Museum at Sunderland is trying the experiment of exhibiting small tanks containing marine life collected from the rock pools at Roker.

We see from the press that early in December a young seal was found in a rock pool at Filey. It was about half grown. The species is not stated.

Sir Arthur Smith Woodward's Presidential Address to the Dorset Natural History and Antiquarian Field Club has been received, and deals with the Saurians found in the Lias in the South of England.

From Dr. George Sheppard we have received 'Observations on the Geology of the Santa Elena Peninsula, Ecuador, South America,' reprinted from *The Journal of the Institution of Petroleum Technologists.*

For the remarkably small price of sevenpence, Messrs. Watts & Co. have issued *The Earth : Its Nature and History*, by Edward Greenly, being one of the 'Forum Series.' The publication has 54 pages, and is well printed.

Part II. of Dr. K. H. Barnard's magnificent monograph on 'The Marine Fishes of South Africa has just been published by the Trustees of the South African Museum. It forms Volume XXI., and occupies pages 419 to 1066.

From Professor M. J. Welsch we have an extract from the *Bulletin de la Section de Géographie*, 1926, entitled 'Modifications Anciennes et actuelles des Côtes du Centre-ouest et du Sud-ouest de la France erosion des falaises, marais maritimes, dunes de sable.'

We have received a syllabus of the excursions of the London Natural History Society for 1928, and readers of *The Naturalist* who may be in the district are invited to attend any of these rambles. Particulars can be obtained from Mr. J. P. Hardiman, 1 Chatsworth Road, Brondesbury, N.W.2.

An extraordinary series of statistics, graphs, diagrams, etc., dealing with almost every possible aspect of the various mines and quarries in Great Britain, appears in the *Sixth Annual Report of the Secretary for Mines for the Year ended* 31*st December*, 1926, *and the Annual Report of H.M. Chief Inspector of Mines* for the same period. (H.M. Stationery Office, 179 pp., 5/6 net.)

The Sunday Pictorial has now started a 'Nature Notes,' and we must congratulate the paper on the following : 'Over field, fen, farm and fender daylight wanes as darkness approaches, empty lanes are deserted and night falls upon the thickening mud with a sickening thud. Across the river, now damp with moisture, comes the cry of the corncrake, the creak of the crib-cracker, the rough cough of the chough, the baa-baa of the black sheep, the chew of the cud, and the "Say-bo" of the lank Yank.'

Mr. A. C. Hardy has been appointed Professor of Zoology at the Hull University College. He studied at Naples in 1921, and then took the post of Assistant Naturalist in the Fishery Department of the Ministry of Agriculture and Fisheries, and in the spring of 1924 was appointed Chief Zoologist to the Discovery Expedition. Professor Hardy has also worked at the Plymouth Marine Laboratory, and in the summer of 1924 was the guest of Professor Johan Hjort on the *Michael Sars* on a short expedition in the waters round Iceland and the north of Norway.

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NOTES AND COMMENTS.

ASPECTS OF MINING.*

One cannot but admire the apparent ease with which the author of this work has dealt with the practical side of mining from almost every conceivable aspect. The photographs, diagrams and other illustrations leave nothing to be desired. There are fourteen chapters in which various terms are described, methods of shafting and mining illustrated, and then are methods of working coal seams in various parts of this country, and also in the United States of America, Africa, India, Australia, and elsewhere. There are chapters dealing with Gold-mining, Iron-mining, Oil Shale, Rock Salt, China Clay, Salt, Limestone, Marble, and numerous other minerals. The Coal and Iron Mines of the North of England come in for particular attention.

The Berry Excavator at the Frodingham Ironstone Mines, Ltd.

INDEX ANIMALIUM.

Before 1927 closed, Part XIV. of Sherborn's 'Index Animalium' was issued, which brings the publication up to 3746 pages. An idea of the extraordinary amount of research necessary is shown by the fact that in the word *lobatum* (*lobata* and *lobatus*) there are no fewer than 132 entries; that is to say, this specific name has been given to 132 species by a similar number of naturalists, and the reference to the places where the species is given for the first time in each instance is shown in full. With regard to *longicauda* there are 109 entries, and *longicollis* no fewer than 111 entries, while for *longicornis* there are 209 entries.

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* 'The Working of Coal and other Stratified Minerals,' by H. F. Bulman. London: E. Benn, Ltd. xv.+338 pp., 42/- net.

WHO'S WHO, 1928.*

We well remember a certain den in a well-known newspaper office where particulars of the lives of various people were pigeon-holed, and every now and then these were examined and added to, as important events occurred likely to be of use when writing up an obituary notice ! We also remember the anxiety with which the matter was revised when any important person was announced to be ill. That office and its pigeon-holes, and the somewhat antiquated members of the staff, have now disappeared, and in its place stands a single volume, which can quite easily be handled, although it contains particulars of 34,000 people. These biographies are revised each year by the various people mentioned, and, in addition, there is a list of those who have died during the previous year, and a useful list of abbreviations.

YORKSHIRE NUMISMATICS.

It is not often that one expects to find natural history information in a volume dealing entirely with Numismatics. *The Transactions of the Yorkshire Numismatic Society*† contains an important paper on 'The Fauna Illustrated on Roman Coins,' by Mr. Frank Heeley, whose researches have revealed no fewer than 86 different forms of animal life depicted on Roman coins struck somewhere about two thousand years ago. These are described in detail. The publication also contains illustrations of recent discoveries in the way of tokens ; newly-published medals, including a fine one issued by the Spalding Gentlemen's Society ; and an article on Medals Designed by Mr. Percy Metcalfe, who is a Yorkshireman. The Report has a List of Yorkshire Silver Tokens, with illustrations, and portraits of the Past-Presidents and other officers of the Society, many being familiar to Yorkshire naturalists.

NEWCASTLE NATURALISTS.

The Report of the Council of the Natural History Society of Northumberland, Durham and Newcastle-upon-Tyne is anything but flattering to Newcastle. We learn that 'it has not been possible owing to lack of funds, during a year upon which the far reaching effects of the protracted Coal Strike have pressed heavily, to begin the important work and reparations which the Curator so clearly pointed out in his last report as being necessary even for the preservation of the Hancock Museum and its collections. Indeed, to meet the bare requirements of general upkeep, it has been necessary to draw upon the Crawhall Bequest. This is far from a satisfactory condition, and the Council invite every member to help, either by contributions towards an Endowment Fund or by securing additional subscribers. Owing to the heavy cost of printing and straitened finance, it has been found necessary to suspend the publication of the Transactions which are so important to a Society whose record of scientific work in the past has been of a high standard.'

---

* London : A. & C. Black, Ltd., xlii.+3324 pp., 45/- net.

† Vol. III., Part 1 (A. Brown & Sons, Hull., iv.+56 pp., 5/-).

OCEANIC ANGLER-FISHES.*

The Angler-fishes are distinguished from all other fishes by having the first ray of the dorsal fin placed on top of the head and modified into a line and bait. Most members of the group live on the bottom in shallow or moderately deep water, and resemble in colour the ground on which they lie, or the rocks and weeds among which they lurk ; their bait is a flap or tassel at the end of the line, or filamentous first dorsal fin-ray, and is moved about to attract their prey. One group of Angler-fishes, the Ceratioids, inhabit the open ocean, and live not at the bottom but in mid-water, generally from about 500 to 2000 metres (250 to 1000 fathoms) below the surface. In this region there is little or no light, and these fishes are mostly uniformly blackish in colour, and their bait is a luminous bulb. They float about in the darkness, attracting their prey with their gleaming bait, which is not intended to be seized, but to act as a lure to bring other fishes near enough to be caught. About fifty different kinds of Oceanic Anglers are known, and these exhibit an extraordinary diversity in form, size and shape of the mouth, strength of the teeth and structure of the lure. In some species the luminous bulb is placed directly on the head, in others it may be at the end of a very long line ; this line, like other fin-rays, articulates with the end of a basal bone that is generally hidden under the skin, but in some species projects and appears as a long rod. Such forms, with rod and line, may be considered true anglers, and one (*Lasiognathus*) in which in addition the line is produced beyond the bait and ends in a triangle of hooks, may be termed a complete angler. The teeth are generally slender and sharp, and are depressible inwards, facilitating the intake of prey, but becoming erect to prevent any attempt at escape. In some species, especially those with the largest mouths and most formidable teeth, the stomach is extraordinarily distensible, and they have been known to swallow fishes three times their own length and many times their weight.

---

* This description is taken from the 4-page slip accompanying a packet of five post-cards, sold at the British Museum (Natural History) at 6d. There are two series of these cards, and the illustrations are almost unbelievable !

PARASITIC MALES.

The most remarkable peculiarity of the Oceanic Anglers is that all the free-swimming fish are females, and that the males are dwarfed and parasitic on the females. The habits and conditions of life of these fishes, solitary, sluggish, floating about in the darkness of the middle depths of the ocean, make it evident that it might be difficult for a mature fish to find a mate. This difficulty appears to have been overcome by the males, as soon as they are hatched, when they are relatively numerous, seeking the females, and if they find one holding on to her and remaining attached for life. The males first hold on by the mouth ; then the lips and tongue fuse with the skin of the female and the two fishes become completely united. The male, without a lure, with mouth toothless and closed in front, and with the alimentary canal vestigial, cannot feed himself and is nourished by the blood of the female, the blood-systems of the two being continuous. The husband is merely an insignificant appendage of his wife. The Ceratioids are unique among backboned animals in having dwarfed males of this kind, and unlike all other animals in having the males nourished in such a manner by the females.

MARINE FLAKED FLINTS.

In *Science Progress* for January a writer deals with sea action and the flaking of flints. He says ' the observations I have been able to make on the action of the sea in flaking flints have convinced me that while this agent can, under certain conditions, remove small flakes from the edges of some flints, this is usually the limits of its capabilties in this respect. And even with the specimens so broken an enlightened examination of the flaking along their edges will show that while it conforms to that which can be produced experimentally by fortuitous percussion, it differs widely from flaking, which is the result of human blows delivered intentionally with a hammer-stone. In some cases a flint which has received a violent blow, from whatever cause, before it arrived in the sea, may, by the lesser collisions upon the beach, fracture along the original line of cleavage produced in the specimen by the ancient blow. Such flints present a new and unchanged surface of fracture, and this fact may mislead some observers into believing that the observed fracture is due solely to sea-action. The conclusion at which I have arrived, after a very careful and prolonged examination, is that the modern sea does not flake flints in a manner indistinguishable from that which goes to form flint implements, and as this is the case, I regard it as reasonable to conclude that ancient marine action was no more successful.'

WATER DIVINING.

On the same page another writer deals with the divining rod, and states ' I suppose every water-geologist is continually finding himself upon the heels of the diviner ; at least it has been my experience for over thirty-five years. During that period I can safely say that I never knew of a single case in which he located water in a place that would have surprised a hydrologist : on the other hand, in almost every case he has been hopelessly wrong, and has often plunged the dupe into useless and great expense. I have always found that he makes a study (in his own way) of surface features, but is invariably not only ignorant of the elements of geology, but ridicules the idea of that science.

POTTERY FROM A WILTSHIRE LONG BARROW.

Mrs. M. E. Cunnington has published, for private circulation, an account of The Pottery from the Long Barrow at West Kennet, Wilts.* ' Judging from the few fragments of rim there seem to have been vessels of a good many different shapes. The ornament also, within certain limits, shows very considerable variety. The ware is mixed with broken shell, particles of flint, some at least of which had been burnt before mixing with the clay ; sand in which there are bright specks, apparently of mica ; and occasionally fragments of an iron stone, probably pyrites. Shell and flint, as well as sand, are sometimes mixed in the same piece. The shell in the ware from the long barrows at Norton Bavant and Lanhill was identified as fossil, but it is not known in the case of West Kennet whether the shell used was all, or any of it, derived from fossils ; there seems no particular reason why the shells of living mollusca should not have been used. The West Kennet people would have had no difficulty in getting fossils from the oolite beds only a few miles away ; Thurnam mentions that pieces of oolite were found in the barrow.'

THE ORNAMENTATION.

'The predominating tendency is to arrange the ornament in narrow horizontal rows or bands. The bands consist of stamped or punched impressions, cord impressions, or simple lines. Herring-bone pattern occurs frequently, but it is remarkable that the running chevron pattern, so common on Bronze Age cinerary urns, is conspicuous by its absence.

---

* Messrs. G. Simpson & Co., Ltd., Devizes, Wilts. 19 pp., 5/.

The ornamental lines frequently appear to have been impressed on the soft clay by means of a twisted cord or thong ; but in many cases this effect was obtained by the use of a specially notched or serrated tool, and sometimes even by separate punch-marks, placed close together, one under the other. Sometimes a furrow seems to have been made first in which to receive the impressed or stamped ornament. Sometimes simple furrowing was used, 'Finger-tip' or 'Finger-nail' markings occur, but in most cases these were made by a tool, and not the actual impression of a finger. Stabbing, or deep punching, also occurs, and in one instance circular punch-marks.'

THE SEVEN AGES OF A MINE.*

All the world's a stage,
And all the mining properties are players ;
They have their exits and their entrances ;
And one mine in its time plays many parts,
Its acts being seven ages. At first the outcrop,
Bringing rich visions to the claimant's eyes.
Then the hopeful prospect, with a lone man ;
Its stubborn, rockbound tunnel creeping like snail,
Unwillingly to ore. And then the company,
Sighing for money, with a long prospectus
Made to its ore-vein's value. Then a bonanza,
With rich new strikes, the leader in a boom,
Boastful of profits, oft in rise and fall of stock,
Seeking the bubble, big mill tonnage,
E'en by sending waste with ore. And then the noted mine
In well kept treasury with good surplus lined,
With ore blocked out, and cost an idol grim,
Full of old stopes and modern drifts-on-vein,
And so it plays its part. The sixth age shifts
Into the lean and hopeless leasing time,
With shoots worked out and vein pinched thin,
Its youthful mill, well saved, a world too big
For its shrunk stopes, and its big ore stream proud,
Changed now into the leasers' dribble, thumps
And rattles down the hungry bins. Last scene of all
That ends this strange eventful history,
Is bleak abandonment, and mere oblivion,
Sans ore, sans hoist, sans mill, sans everything.

——: o :——

S. Tomkeieff writes 'On the Occurrence and Mode of Origin of certain Kaolinite-bearing Nodules in the Coal-measures near Newcastle-on-Tyne,' in *The Proceedings of the Geologists' Association*, published on December 28th.

---

* A Pseudomorph after 'The Seven Ages of Man,' in 'As You Like It,' Act 2, Scene 7, by F. J. Girard, in *Engineering and Mining Journal.*

PRECOCIOUSLY-EXPANDING BUDS AND THEIR RELATION TO THE PROBLEM OF BUD-SCALE MORPHOLOGY.

ADRIANCE S. FOSTER, Sc.D.
(*Harvard.*)

THE unusual weather conditions prevailing throughout England during the past summer appear in some way to have favoured the development of ' summer shoots ' (Johannistriebe) in many Yorkshire trees and shrubs. Professor J. H. Priestley (8), in a recent communication to this journal, has pointed out some of the physiological and climatic factors which may be operative in the production of this secondary leafage in woody plants. That we are dealing with a disturbance in the normal periodicity of the plant seems perfectly clear, for under ' normal ' circumstances, the terminal and axillary buds are highly differentiated at the beginning of the winter ' rest period,' and remain in a dormant condition until the following spring. In the writer's experience, it is only in exceptional plants, such as *Sassafras officinale* Nees., and *Clethra alnifolia* L., that the uppermost axillary buds of the main shoot normally expand during the period of their formation without developing bud-scales.

During the normal expansion of the buds in spring, the internodes between the lower bud-scales exhibit little or no development in contrast to the typical internodal elongation of the foliage-leaf region of the shoot. The relation of this fact to the ' causal ' aspects of the problem of bud-scale morphology has already been emphasised by the writer (4). An attempt is made in the present paper to document this relationship by recording some observations made on the precociously expanding buds of a number of American woody plants. In the cases to be described the axillary buds had been forced to develop at a relatively early stage, and foliage-leaves, with elongated internodes, frequently appeared in place of bud-scales. Whether these examples are directly comparable with the proper ' Johannistriebe ' requires further investigation.

A further aim of this paper is to show that the prematurely opening bud throws considerable light on the specific morphology of the bud-scales in many cases. It is a recognised morphological fact that the axillary buds of most woody Dicotyledons begin with a pair of opposite lateral scales. The unusual position of these organs (especially in plants with spirally arranged leaves) has earned for them the special name of ' prophylls.' Whilst in many plants each ' prophyll ' is equivalent to a single foliar organ, considerable doubt exists regarding the morphology of these structures in stipulate-leaved plants such as beeches, oaks, hazels, etc., where the upper bud-scales clearly represent pairs of modified stipules. Some writers, *e.g.*, Eichler (2) have regarded each 'prophyll' in these plants as a single 'leaf.' However, Velenovský (9) and Kŏstál (7) have produced evidence to show that the so-called 'prophylls' of many of the Amentiferæ represent *a pair of modified stipules* whose *posterior* leaf remains small, or is completely abortive in the formation of the winter bud. The present study confirms this interpretation for some, but not all, of the main genera of the Fagales.

BETULACEÆ.

1. *Alnus mollis* Fernald. The axillary winter buds are provided with a single posterior (*i.e.*, addorsed) scale which shows no development in spring and is followed by normal stipulate foliage-leaves (*cf.* fig. 1). On July 18th, 1925, the first appendage of the expanding axillary buds of root sprouts was a small *posterior* stipulate foliage-leaf, well-removed from the leaf axil. This observation suggests that the addorsed scale of the winter bud has developed from a single leaf-initial, *without segmenting into leaf-blade and stipules*. Support is lent to this interpretation by the fact that *normally* the first leaf-primordium of the axillary bud of *Alnus rugosa* (Du Roi) Spreng. forms a posterior foliage-leaf which is covered by its own stipules in winter (*cf.* fig. 2).

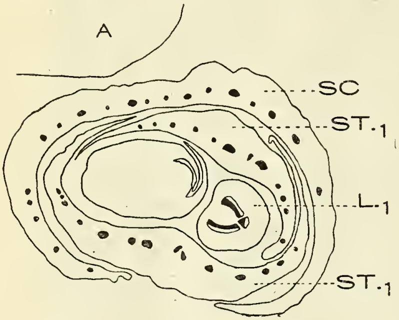

Fig. 1.

Alnus mollis. Transverse section near base of axillary bud, showing the addorsed bud-scale and the first stipulate foliage-leaf. × 14.

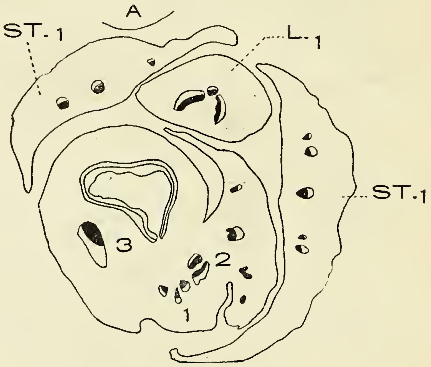

Fig. 2.

Alnus rugosa. Transverse section near base of axillary bud, showing the addorsed stipulate foliage-leaf. The three traces supplying the second foliage-leaf have left the bud-stele. × 12.

The following legend is employed for the figures in this paper :—

LEGEND :—A. = axis of twig ; B. = subordinate bud ; L. = leaf of bud ; SC. = bud-scale ; SL. = subtending leaf of bud ; ST. = stipule.

2. *Betula populifolia* Marsh. A transverse section[1] near the base of the axillary bud of this species shows that the outer pair of scales (*i.e.*, the so-called 'prophylls') are really modified stipules which enclose a minute, normally abortive posterior leaf (*cf.* fig. 3). These stipular scales develop no further in spring, and are followed by stipulate foliage-leaves (*cf.* fig. 4). It is of interest to note that Kŏstál (*op. cit.*), on the basis of developmental evidence, likewise interpreted the first pair of bud-scales in *Betula alba* L. and *Alnus cordata* as stipules. Observations made on June 12th, 1925, on coppice shoots of *B. populifolia* with opening axillary buds showed that the normally abortive posterior leaf (*cf.* fig. 3) had attained considerable development and was elevated some distance above the leaf axil. In particularly vigorous coppice shoots of *Betula lenta* L., a small bud had formed in the axil of this posterior foliage-leaf.

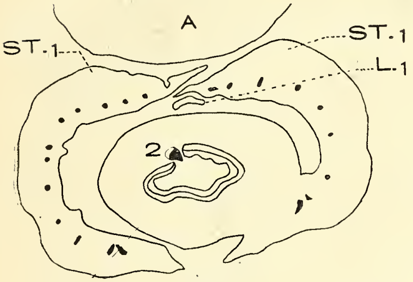

Fig. 3.

Betula populifolia. Transverse section near base of axillary bud, showing the addorsed rudimentary leaf. The stipular scale at the right is not yet free from the bud-axis. One of the lateral traces supplying the second leaf of the bud is leaving the stele. × 15.

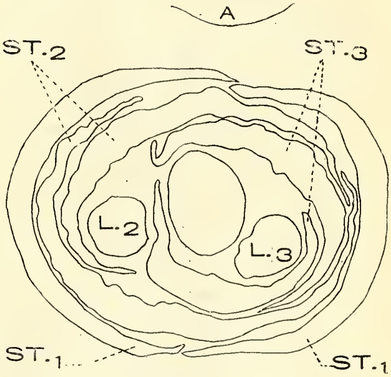

Fig. 4.

Betula populifolia. Median transverse section through the axillary bud, showing the outer pair of stipular scales and two stipulate foliage-leaves. × 14.

3. *Corylus avellana* L. Fig. 5 shows that the axillary bud of this species begins with two subopposite, unequal scales which have been regarded by Döll (1, p. 18), Henry (6, p. 313), and Eichler (2, p. 16) as 'prophylls.' The next two nodes of the bud are occupied by pairs of stipular scales which enclose small, often abortive leaf-blades, as in *Betula populifolia* (compare figs. 3 and 5). The upper appendages of the bud-axis, as shown in Fig. 6, are stipulate foliage-leaves. The

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[1] A method for obtaining serial celloidin sections of winter buds has already been described by the writer (3).

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following considerations seem to indicate that the so-called ' prophylls ' of *Corylus* represent a pair of stipules, the *posterior* blade of which is normally completely arrested in development. Apical buds[1] of *Corylus colurna* L. were dissected on July 18th, 1925, and a small *posterior* bud was found *between* the first pair of scales. By September 20th this posterior subordinate bud was well-developed and protruded between the scales of the main bud (*cf.* fig. 7). Figs. 8 and 9 portray, respectively, a lateral and posterior view of an apical bud with an unusually

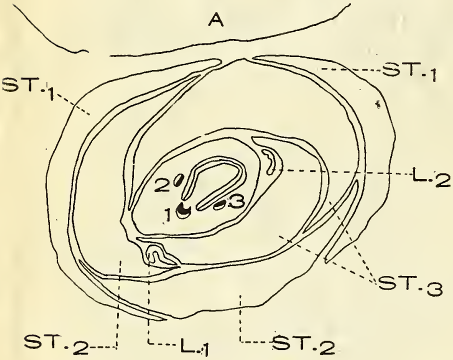


Fig. 5.

Corylus Avellana. Transverse section above the base of the axillary bud, showing the outer unequal pair of stipular scales and the two following rudimentary stipulate leaf-blades. The three traces supplying the third leaf have left the stele. × 13.

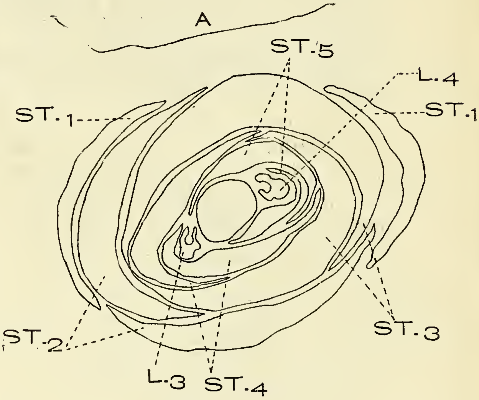


Fig. 6.

Corylus Avellana. Median transverse section through the axillary bud, showing the first two stipulate foliage-leaves. The lower rudimentary leaf-blades have passed out of the plane of the section. × 13.

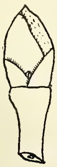
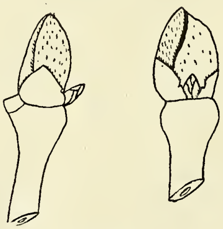


Fig. 7.

Corylus Colurna. Posterior aspect of an apical bud with a small subordinate bud protruding between its first two scales. × 1.



Figs. 8-9.

Corylus Colurna. Lateral and posterior aspects, respectively, of an apical bud with a well-developed subordinate bud protruding between its first two scales. × 1.

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[1] A resting terminal bud is not formed in *Corylus*.

developed subordinate bud ; fig. 9 shows that the growth of this subordinate bud has torn each of its subtending stipular scales.[1] The stipular nature of the ‘ prophylls ’ of *Corylus* is further evidenced by observations made on June 13th, 1925, on the precociously expanding buds of coppice shoots of *Corylus americana* Walt. The first node of the developing shoots was occupied by a pair of green, membranous stipules, which enclosed a small posterior bud ; the next appendage above was a ‘ normal ’ stipulate foliage-leaf. At several vigorous nodes, a minute leaf was found to subtend the posterior bud.

4. *Carpinus caroliniana* Walt. The axillary buds of this species begin with a pair of posteriorly displaced scales which, in the material investigated, are followed by seven pairs of distichous stipular scales without leaf-blades before the first foliage-leaf appears. Döll (*op. cit.*, p. 16), Henry (*op. cit.*, p. 319) and Eichler (*op. cit.*, p. 18) interpreted the first pair of scales in *Carpinus betulus* L. as ‘ prophylls.’ Velenovský (*op. cit.*, p. 409), however, found that on the expanding twigs of ‘ sucker-shoots ’ of this tree, the ‘ prophylls ’ appear as *a pair of stipules* subtending a small posterior leaf. The present writer also regards the so-called ‘ prophylls ’ of *C. caroliniana* as a pair of bladeless stipules. In the majority of the precociously expanding buds of this species observed in June, 1925, the theoretical leaf between the ‘ prophylls ’ had failed to develop, although the following pairs of stipular scales enclosed small leaves and had experienced some internodal elongation. In one bud, however, the ‘ prophylls ’ subtended a minute posterior leaf.

FAGACEÆ.

1. *Fagus grandifolia* Ehrh. The ‘ prophylls ’ of the axillary bud of the American beech are obliquely placed to the axillant leaf and are followed by about eight pairs of bladeless stipular scales ; the first recognisable lamina usually appears at the ninth or tenth node of the winter bud. Observations made on buds expanding on June 14th, 1925, showed a small lamina between the first pair of scales. This fact suggests that, as in *Carpinus*, the ‘ prophylls ’ of *Fagus* are modified stipules whose leaf-blade normally fails to develop during bud formation. Döll (*op. cit.*, pp. 24-25) also regarded the so-called ‘ prophylls ’ of *Fagus sylvatica* L. as a pair of stipules. He found that if beech twigs are kept in a dry condition for about three days, and are then brought into a moist warm room, a small bud developed *between* the ‘ prophylls ’ ; this situation seems comparable to the condition noted above for *Corylus*.

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[1] Goebel (5, p. 394) found that the upper female flowers of the hop arise *between* bladeless stipules.

2. *Castanea pumila* (L.) Mill. The winter buds of the sweet chestnut are like those of *Betula* in that stipulate foliage-leaves follow a pair of 'opposite' unsegmented scales which normally show no development in spring (compare figs. 4 and 11). The usual association of an axillary bud with *each* scale in *Castanea*, however, indicates clearly that we are dealing with separate foliar organs and not with a single pair of stipules (*cf.* fig. 10). It seems probable that the bud-scales in *Castanea* have arisen from leaf-primordia, which failed to segment into leaf-blade and stipules. Observations were made on June 12th, 1925, on precociously opening buds of *Castanea dentata* (Marsh.) Borkh. The first two appendages of the developing shoots were opposite or *subopposite* green, scale-like structures, each with a bud in its axil. In the case of expanding buds of coppice shoots of *C. ozarkensis*, very noticeable internodal elongation had occurred between the accrescent bud-scales (*cf.* fig. 12). This figure also shows the characteristic elevation of the scale nodes from the leaf-axil, which is a common feature of prematurely developing buds.

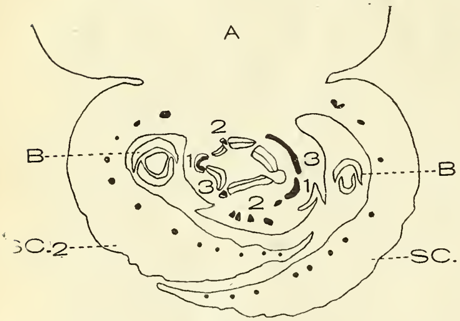

Fig. 10.

Castanea pumila. Transverse section near the base of the axillary bud, showing a bud in the axil of each of the two scales which are still posteriorly attached to the bud-axis. Three traces have left the steel at the right for the first foliage-leaf and the vascular supply is departing to the second leaf at the left. × 15.

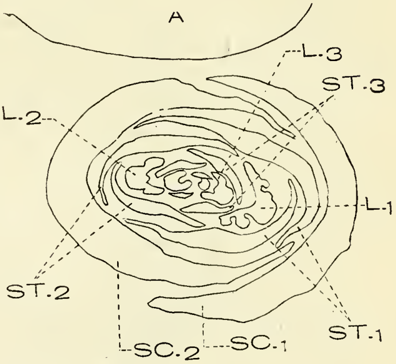

Fig. 11.

Castanea pumila. Median transverse section through the axillary bud showing five stipulate foliage-leaves enclosed within the bud-scales. × 14.

3. *Quercus*. A number of investigators, such as Döll (*op. cit.*, p. 27), Henry (*op. cit.*, p. 338), Eichler (*op. cit.*, p. 26) and Goebel (*op. cit.*, p. 386) have maintained that whilst the upper scales of the axillary buds of the oak represent pairs of modified stipules, the first two opposite foliar organs at the base of the bud are simple prophylls. Almost no evidence, however, has

been given to support this interpretation. The following facts suggest that each of the so-called 'prophylls,' at least in a number of American oaks, represents a single foliar organ. In the first place, a small subordinate bud quite often appears in the axil of each 'prophyll' of the winter buds of *Q. ilicifolia* Salisb., *Q. velutina* Lam., *Q. borealis* var. *maxima* Ashe., and *Q. imbricaria* Michx. Fig. 13 represents a lateral view of an axillary bud of *Q. prinoides* Willd. sketched September 22nd, 1925. A small bud may be seen in the axil of one of the 'prophylls' which has become cleft nearly to the base. The separate foliar nature of the 'prophylls' is further indicated by observations made during June on the precociously expanding buds of stump-sprouts of *Q. borealis* var., *maxima* and *Q. velutina*. In the first species, the base of the developing shoot was subtended by two small *opposite* stipulate foliage-leaves, each with a bud in its axil; the next appendage, *high* on the axis, was a well-developed foliage-leaf. Essentially the same condition was found in *Q. velutina*, except that the first two opposite leaves appearing in place of the 'prophylls' were larger and more like the typical foliage-leaves in appearance. These observations are of considerable interest in the light of Kŏstál's (*op. cit.*) work. He found that the first two leaves on axillary shoots of seedlings of *Q. Phellos* L. were transversely placed, and that each leaf develops its two stipules in quite a normal fashion.

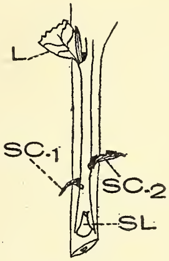

Fig. 12.

Castanea ozarkensis. Anterior view of a portion of a precociously developed axillary shoot. The two bud-scales have experienced internodal elongation and are elevated from the leaf-axil; each scale bears a small axillary bud. The subtending leaf of the axillary shoot and the upper portion of the lamina of its first leaf have been removed. (Enlarged.)

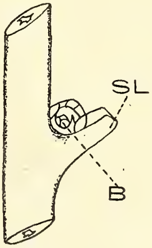

Fig. 13.

Quercus prinoides. Lateral view of an axillary bud with a small subordinate bud in the axil of one of its 'prophylls.' The upper portion of the subtending leaf of the main bud has been removed. ×4.

Whether the 'prophylls' of the species just discussed are equivalent to 'fused' stipules, as Ward (10, p. 218) believed was the case in *Quercus robur* L., requires developmental proof. The more important fact remains that the primordia which normally give rise to the unsegmented 'prophylls' can develop into foliage-leaves, presumably under conditions of extreme 'vigour.'

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Dr. Coffin, Dr. Skelton and Mr. Barker have articles in *The Medical Herbalist* for December.

H. King writes on 'The Geography of Settlements in South-west Lancashire,' in *Geography*, No. 79.

The Ibis for January contains some remarks upon 'The Food of Flycatchers,' by Dr. W. E. Collinge.

'The Lichens of the Isle of Man,' by J. W. Hartley and J. A. Wheldon, appears in *The North Western Naturalist*, Vol. II., No. 1.

BIRD RESTS ON SPURN LIGHTHOUSE.

W. H. ST. QUINTIN, J.P., F.Z.S.

SPURN being inaccessible to most of the readers of *The Naturalist*, it occurred to me that the report, as to the use made of the perches by the migrant birds, received from the Principal at the Lighthouse, by the R.S.P.B., and kindly passed on to me by Mrs. Lemon at my request, might be found interesting. I suppose we may assume that the Buntings mentioned were Yellow Hammers, also that the Wrens noticed in the spring were all Golden-crested Wrens, about to start on their return journey across the North Sea.

REPORT.

APRIL 14TH, 1927.—The bird rests have now been in position for a month, and I herewith report on their use.

The first night on which they were used to any extent was March 21st, when a variety of commoner migrants rested on them. These included Blackbirds, Thrushes, Linnets and Buntings.

On March 26th and 27th there were again plenty of birds, the rarest birds recognised were Water Rails. On each of these nights there was a dozen or so of these resting, and in each case one was killed on arrival at the lighthouse by flying straight at the glass, their flight being so swift that they were killed immediately. On the approach of dawn the remainder flew away in a north-east direction in company of most of the other birds. Apart from Starlings and Larks, the rests were not in general use again until April 2nd and April 6th, when there was a good number of Redwings and Whitethroats and a few Golden-crested Wrens. On the whole the number of birds have been up to the average, but more distributed, and on no occasion so far this season have the perches been entirely covered with birds.

MAY 16TH, 1927.—The bird rests have now been in position two months, and I herewith report on their use. The rests have not been used by the birds to any great extent this month. Only on three occasions were any number of birds using them. At other times a few would rest for a time and then leave. Birds noticed were Thrushes, Buntings, Wrens and Finches. One Sparrow-hawk was killed through striking the roof, and a few Buntings were found dead. Not so many Starlings as last month, and no Blackbirds were noticed.

OCTOBER 31ST, 1927.—The bird rests have been used by considerable numbers of birds. On several occasions Warblers, Linnets, Whitethroats and Wrens have used them in considerable numbers, also Redwings, Buntings, Thrushes, and a few Blackbirds. On the 22nd and 23rd October the perches were nearly full of birds, chiefly Starlings, since those dates there have not been such large numbers, but most cloudy nights there are varying numbers resting.

November 16th, 1927.—The bird rests have not been used to any great extent since my last report. On two occasions a considerable number of Starlings were perched, and a few Redwings, Finches, Blackbirds and Thrushes on other occasions. The perches have now been taken down and stored for the time.

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Waxwing in Upper Wharfedale.—In *The Field* of January 19th, 1928, Dr. K. C. Crosbie, of Grassington, reports that a Waxwing was picked up dead in the grounds of Netherside Hall, Threshfield, on December 29th, 1927. It was evidently a female by its dull plumage and only five 'wax' tips. No others were seen.—H. B. Booth.

Ring Ouzel marked in Yorkshire and caught in Spain.—In *Country Life* of January 28th, 1928 (p. 127), Mr. H. W. Robinson reports that he ringed a nestling Ring Ouzel, one of a brood of three, with ring No. 2288, on May 23rd, 1927, on Dent Fell, West Yorkshire. This bird was shot on September 14th, 1927, by Senor Tonias Mendizabal, at Engui, Navarra, about forty miles inland from San Sebastian, and just south of the Pyrenees.—H, B. Booth.

Coleoptera near Wigton.—*Leistus fulvibarbis* is common about Kelsick, and *L. rufescens* is far from rare, although no woods are near. One crippled specimen of *Pterostichus versicolor* was all I saw of that species. *Amara ovata* occurred several times in the garden at Kelsick. *Bembidium monticola* on the sandy banks of the River Waver. *Dromius 4-maculatus* under Sycamore bark, Kelsick. *Falagria obscura*, several under stones. *Conosoma lividum*, common in cut grass. *Tachinus collaris*, not rare in fields near Kelsick. *T. marginellus* and *T. laticollis* were both common, the latter especially. *Stenus guttula*, banks of River Waver. *Creophilus maxillosus*, one among rotting potatoes in a field. *Othius fulvipennis*, one under a stone at Waverton. *Lithocaris ochracea*, one in cut grass at Kelsick. *Geodromicus nigrita* and *Lesteva longelytrata* were not uncommon on sandy banks by the River Waver in June. *Megarthrus denticollis* and *M. sinuatocollis*, in cut grass left as a beetle trap at Kelsick. From flood refuse from River Waver, I obtained *Ocypus cypreus*, *Philonthus politus*, *P. varius*, *P. fimitarius*, *Xantholinus linearis*, *Stilicus rufipes* (four specimens), *Stenus nitidiusculus*, *S. paganus*, *Olophrum piceum*, etc.—Jas. Murray, Gretna.

THE YORKSHIRE NATURALISTS' UNION'S ANNUAL REPORT

FOR 1927.

(*Continued from page* 60).

Starlings were seen feeding young in the nest early in July, thus showing that some of these birds are double brooded. A Woodcock's nest was found on the 31st March with four eggs, and four young with primaries sprouting on the 12th June in the same locality where the bird is increasing. The little owl is extending its range, having now reached Brough. Four eggs were seen at North Cave. Five birds were on the Keepers Pole at Houghton, and numerous captures recorded at Escrick Park. The birds are frequently taken in rabbit traps, probably having been caught when searching for beetles. Mr. C. F. Procter reported that one had descended the chimney of his shooting box at Cherry Cob Sands, seeking distraction in the fire, which seems to indicate an immigation across the Humber.

A Waxwing was seen at Walkington on the 21st November, 1926.

The Corncrake has been very scarce this year; only four birds being reported in Holderness and Howdenshire.

A Stone Curlew was shot in May on the Wolds, the excuse given being that the shooter wished to ascertain what the strange bird was. Thus our Yorkshire Stone Curlew is disappearing through the wanton destruction of ignorant men.

A Montagu's Harrier (immature) was trapped near Arram in June, the bait being a rabbit which it had killed, and is now in the Beverley Museum.

York District (Sydney H. Smith, F.Z.S.) :—The year has been remarkable because of the abnormal rain, which has kept the country almost continually in a flooded state, and the effect on bird life has made successful nesting of both resident and summer visiting species very difficult. The effect will not be so noticeable this year as next, and it will be interesting to make comparisons in our next report.

Generally most of our summer visiting birds were late in arriving, but so far as this district is concerned, they appear to have been in their usual numbers, except those of the Swallow species.

There was a noticeable decrease in the number of Cuckoos, but a distinct increase among Whinchats, Willow Warblers, Whitethroats and Sandpipers. The Linnet has also increased in this district, and in one field at Wigginton, no less than seventeen nests were noticed ; this is undoubtedly due to the Wild Birds Protection Acts.

Landrails are still rare, but shew a small increase on previous years ; a nest containing two eggs was found among some nettles at Bishopthorpe on May 11th.

Kingfishers and Dippers are generally increasing, and are quite a feature of the river and most of the streams around York.

Curlews have become quite a feature on Strensall Common, and on May 12th, four pairs were seen and two nests discovered—one with two eggs, the other with four—all of which were duly hatched.

Nightjars, once common at Strensall and Skipwith, have almost disappeared ; only one pair is reported as having nested at the latter place, and one pair were seen at Strensall, but their nesting is doubtful.

Great Crested Grebes have been noticed in all their usual haunts, and maintain themselves most satisfactorily. Some had nested on the lake at Castle Howard, as well as other places. One pair on the pond at Aldersyde, York, had their first clutch of eggs destroyed by a Coot, but another nest was constructed and two young were raised.

Only one pair of Reed Warblers were seen at Castle Howard this year, and it is evident the interesting little colony that had established themselves have suffered from repeated bad seasons, and dwindled in consequence, as I am quite sure the eggs have not been taken by collectors.

The Turtle Dove, once so rare, is now a frequent summer visitor, and is found in most of the woodlands in this area ; several were seen at Ampleforth on June 7th, probably not long arrived.

The Woodcock has nested in several places, and one pair with young was observed at Kexby on April 28th.

A pair of Pied Flycatchers with five young ones were seen at Aberford on June 25th, and four young Hawfinches were seen in the nest at Pocklington on June 28th.

A pair of Kestrels were successful in rearing a brood of young in the main tower of York Minster ; the old birds were observed feeding their young on several occasions.

Last year I recorded the raiding of a Rookery by Owls at York ; this has occurred again in 1927, when a Tawny Owl raided the young rooks from nests in a tree in Bootham Park, and also from the rookery in the gardens of the Judge's House at York.

Redshanks must have suffered from the floods, as only one pair nested at Skipwith, and it is doubtful whether any were successful at Wheldrake, as the Ings at this point have been under water for long periods.

Two nests of the Marsh Tit were found on Skipwith Common, and another nest at Wigginton.

A pair of Short-eared Owls with four young ones were seen on Strensall Common on May 4th, and on the same date and place several Curlews, Carrion Crows, Jays and Magpies were seen.

Both Mallard and Teal Ducks were nesting on the S Lake, and a pair of Shoveller Ducks that were seen may possibly have nested.

Reed Buntings are fairly numerous, and there were plenty of Linnets amongst the gorse.

The Hooded Crow, once so common as a winter visitor, is seldom noticed, and three seen at Huggate on February 10th were at once remarked.

Green Plovers, which have been accorded special protection, appear to be somewhat less in number than in previous years, but this suggestion is purely local. The first nest was seen at Shipton on March 27th, and very much later than usual.

Mr. Fred Vear, of York, supplies me with an interesting report on the colony of Black-headed Gulls at Skipwith. His wonderful photographs of this species, and his close observations at Skipwith, mark him as an authority.

On April 3rd there were approximately three to four hundred Gulls on the Common. The Sedgy Nesting Clumps in the main pond were almost submerged, owing to the recent heavy rains. By May 8th the number of Gulls had increased to about 1200. Nesting operations were decidedly late as compared with previous years. Very few eggs were observed on this date, but more nesting birds had occupied the ' Horse Shoe ' Pond.

On May 14th—still raining heavily—the number of Gulls were still increasing to an estimate of 1550. Many more eggs were in the nests, particularly those on the far side of the main pond.

On May 21st there was another increase in the number of eggs, but it was also apparent that all the nests near to the edge of the pond had been plundered. No young birds were observed, although on the corresponding date in previous years fair numbers were seen.

On May 30th—a dull day, with rain at night—several young Gulls were observed amongst the rushes on the far side of the ponds, and again it was noticed that numbers of the eggs had been taken from all nests that it was possible to reach.

On June 11th, many young Gulls were in evidence, and in various stages of growth, but there was still large numbers of eggs left unhatched. The gamekeeper (Mr. J. Morris) stated that he had observed three or four Lesser Black-backed Gulls busy amongst the nesting birds. Ample evidence of this destruction was forthcoming, and empty egg-shells were found at considerable distances from the pond.

On June 30th the young Gulls were in good numbers, but mainly on the far side, or more inaccessible portion, of the main pond. The nesting clumps near the edge of the ponds only contained about twenty young birds. The general inference is that the number of Gulls breeding on the main nesting pond was considerably less than in preceding years, 1921-1926, but there was some increase in the number nesting on the adjacent pond nearest the road, this pond being much more inaccessible to the human raider.

Compared with normal seasons, the nesting operations were a fortnight later. Usually the maximum number of young Gulls have been observed on and about June 6th.

Mr. Vear asks me to deplore the plundering of the eggs, and to request that the Yorkshire Naturalists' Union, and all who are interested in Yorkshire Ornithology, should endeavour to protect the Skipwith Gullery in every way where they can bring their influence to bear.

The colony is a great delight to the naturalist and to everyone who can appreciate the beauties of nature, and no effort should be spared to assist the landowner in maintaining what is, in early summer, the most wonderful sight of bird life in mid-Yorkshire.

ARRIVAL OF EMIGRANTS, YORK DISTRICT, 1927.

April 3—Chiff Chaff, seen at York (and at Brandsby, April 16th).
Swallows, seen at Welburn (and at York, April 23rd).
Whitethroat, seen at Castle Howard.
,, 14—House Martins, seen at York (and at Market Weighton, April 30th).
Sand Martins, seen at York.
,, 23—Cuckoo, seen at Strensall and Acomb, York (and Wigginton, May 1st).
,, 28—Sandpiper, seen at York (and Helmsley, April 30th).
,, 29—Swift, seen at Clifton, York (and at Sheriff Hutton, May 1st).
,, 30—Yellow Wagtail, seen at Helmsley (and at Bishopthorpe, May 3rd).
May 15—Redstart, seen at Castle Howard.

I am greatly indebted to Mr. V. G. F. Zimmerman and Mr. Fred Vear, both of the York Naturalists' Society, for their valued assistance in compiling this report.

I am informed by Mr. James Kendall, of Selby, that the Great Crested Grebe has been successful in rearing a brood of young on a pond in the neighbourhood of Selby, but only after two futile attempts.

The nest is repeatedly robbed, in spite of warnings in the form of posters at the pond, issued in the name of the Yorkshire Naturalists' Union and the Selby Naturalists' Society.

(These notices may be a disadvantage, as they draw attention to the presence of this interesting species.—S.H.S.)

MAMMALS, AMPHIBIANS, REPTILES AND FISHES COMMITTEE.

Mammals (W. G. Bramley) :—From reports supplied by Messrs. H. B. Booth and S. H. Smith, Otters are becoming more numerous in the Upper Aire valley, and also in the neighbourhood of York. During the afternoon of July 6th two were seen swimming serenely upstream in front of Terry's Avenue, York. Mr. Smith writes : ' It is evident that they have their holt below some of the old wharves, as for many months an Otter has been observed on the wooden breakwater of Skeldergate Bridge during the early hours of the morning.'

On May 18th the compiler of these notes saw a Stoat plunge into the Foss Beck near Bolton Percy and swim the two or three yards to the other side under the water, disappearing into a Water Vole's hole, but it reappeared immediately. Mr. W. J. Clarke informs me that a pied Stoat was seen on the same date by Mr. A. Headges at Forge Valley. It was described as being nearly all white, both above and below.

In spite of the persistently wet weather, Hares have had a fairly good season. Mr. E. W. Wade informs me that he saw a form containing three leverets about eight days old, about October 12th.

On March 20th Mr. Booth visited Marsden Moor, in the neighbourhood of Ashway Gap and Greenfield, to see what effect the mild winter had on the Scotch or Mountain Hare. There was no snow on the hills, and the hares were very conspicuous on the crags. Of the dozen or so that were examined closely, only two shewed the slightest sign of putting on the summer coat. I am informed by Mr. Booth that the ancestors of these hares were first turned down about 1880, and that the mild winter and their forty-seven years acclimatisation in a more southerly locality had had no effect on their winter coats.

The Red Squirrel, according to Mr. Smith, is still to be found in most of its usual haunts, but is somewhat scarce. Mr. E. W. Taylor writes that the Grey Squirrel has apparently ousted its Red cousin in Duncombe Park. The Grey Squirrel continues to be generally in evidence, but so far is not numerous enough to cause complaints of destruction to newly-planted woodlands.

Owing to the prevalence of Moles, farmers in the Castle Howard district recently suggested the appointment of a professional mole-catcher.

I learn through the *Yorkshire Post* that, according to the second annual report of the Hull and Goole Port Sanitary Authority's Medical Officer of Health, no less than 11,333 rats were caught during the year under review. Of these, 4169 were destroyed on board ship, nearly all being the Black or Ship rats.

According to the same authority, a 'Grampus' was taken at Swinefleet by G. & H. Cooledge, on May 29th. It was towed to Goole, where, however, it escaped, and was last seen at Boothferry making upstream. Its length was estimated to be from sixteen to eighteen feet, and its weight at about thirty hundredweights.

Fishes.—I am indebted to Messrs. W. Carter Platts, H. B. Booth and S. H. Smith for the following notes.

The heavy floods of the past summer brought an unusually heavy head of Salmon into those Yorkshire rivers which the degree of pollution still permits to be classed as salmon rivers. A good head of spawners was noted in the upper reaches of the Ure. At the mouth of the Esk netsmen made some good catches. 'Some of the large fish,' says Mr. Platts, 'being identified—by what means I do not know—as having come from the Norwegian side of the North Sea.' On May 29th, J. Oldridge, an eighteen-year-old salmon fisher, netted one of the largest salmon taken in the Ouse for many years. It weighed 47 lb. 2 oz., having a length of 50½ inches and a girth of 26¾ inches.

On February 6th, 1927, a Tench 19 inches in length and weighing 3¼ lb., in good condition, apparently ready for spawning, rolled itself out of Denton Lake, near Ben Rhydding, at a time when these fish are supposed to be hibernating. The mild winter may, however, have had something to do with its appearance at that date.

Mr. Smith still continues to liberate marked Trout, Roach, Rudd and Perch into the River Ouse, and Barton Hill and Isle Becks. He regrets the absence of reports of recapture of marked fish, and will be greateful for same. Of the last batch introduced, only two or three

Trout have been reported. Some yearling Rainbow Trout turned into Isle Beck had grown from three inches to nine inches in six months, and had proceeded well upstream from the point of liberation.

Fishing the may-fly at Kexby, on the River Derwent, on June 13th, Major J. L. Caunter landed a fine Trout of 5 lb. 3 oz, and a length of 22½ inches.

A heavy run of Flounders was the result of the floods, and one of 10 oz. was taken from Fang Foss Beck, near Spittal Bridge, a distance of 90 to 100 miles from the sea. Another of 1 lb. 5 oz. was obtained by Mr. W. Stephenson on September 4th from the River Ouse, near Linton Lock.

The River Derwent yielded two Pike of 19 lb. and 20 lb. respectively. The former was taken at Cottingwith, by Mr. W. C. Oliver, on 16th December, 1926, and the latter on January 9th, 1927, by Mr. J. Fryatt, at West Cottingwith.

The *Yorkshire Post* of 15th August, 1927, reports the capture and slaughter of a ' shark ' at Barmston, near Bridlington, the previous day. It was stated to be from three to four feet long, and was probably a Tope or else a Picked Dog Fish.

Mr. W. J. Clarke, F.Z.S., reports on the Marine fishes as follows :

Most of the records of fishes have been made from the nets of the Scarborough trawlers, but pains have been taken to ascertain that the specimens had been caught within a reasonable distance of the Yorkshire coast. On the authority of Mr. A. Frazer-Brunner, a small example of the Norway Haddock, belonging to the subspecies vivipara, was recorded from Scarborough on July 1st, 1927 (*The Naturalist*, 1927, p. 296).

A few Hake have been landed from time to time from the fishermen's lines, set comparatively close inshore.

An hermaphrodite Cod, bearing both milt and roe, was landed on February 25th. It weighed 14 lb. ; the milt lay between the two lobes of the roe, which were somewhat smaller than usual for a fish of that weight. It was as large as a man's hand.

Single specimens of the Red Gurnard were on the fish market on February 2nd and April 19th. Small Sturgeons were landed by local boats on February 8th and April 11th. A Snake Pipefish was found in a crab pot on April 20th.

A Norwegian Topknot 4⅛ inches long, was trawled near Whitby on October 8th, and an example of Muller's Topknot was caught in a crab pot on May 9th. Starry Rays, formerly considered a rare Yorkshire fish, were common on the fish market throughout the year. Lesser Spotted Dogfish occurred on November 4th, 1926 (two specimens), December 2nd, 1926, a female containing eggs ready for extrusion, and on January 3rd, 1927. A large Tope, quite six feet long, was on the market on January 4th. A small Porbeagle Shark, about three and a half feet long, was stranded on Filey Brig on September 3rd, while a large shark, 15½ feet in length, was captured by a local fishing boat in August, but was not brought ashore.

A Turbot, dark coloured on both sides, was landed on February 20th at Scarborough.

A feature of the year has been the very large catches of Salmon taken by the netsmen at the mouth of the Esk at Whitby. On August 9th, the total catch for that day consisted of 234 fish weighing 3494 lb, together with thirty Sea Trout, weighing 294 lb. The average weight of the Salmon was nearly 15 lb., and for the Sea Trout nearly 10 lb. per fish.

The recorder is much indebted to Messrs. S. Snowden, of Whitby, T. N. Roberts and J. A. Stephenson, of Scarborough, for notes which have been used in compiling this report.

(To be continued).

1928 Mar. 1

REVIEWS AND BOOK NOTICES.

The Skate, by **Charles W. Creaser.** London : Messrs. Macmillan & Co., x.+57 pp., 4/6 net. This little manual is specially prepared for the student in the laboratory by the Assistant Professor of Zoology in the College at Detroit. It describes the various characteristics, systems and organs of *Raja erinacea* Mitchill.

Mendelism, by **R. C. Punnett.** London : Macmillan & Co., xv.+236 pp., 8/6 net. This volume is so well known that it merely leaves us to draw attention to the fact that a seventh edition has now been called for. Since the previous editions many advances have been made in Genetics and in other directions, which have necessitated a revision in its various chapters, but with its beautiful coloured illustrations and reproductions from photographs and diagrams in the text, the publication still remains one of vital importance to the student of evolution and heredity.

Vertebrate Embryology, by **Waldo Shumway** (viii+314 pp., 18/6 net.). From the same house and of a similar origin, the Associate Professor of Zoology at Illinois produces this text-book. It is on similar lines to the preceding, but, of course, much more specialised in view of the nature of the subject. The excellence of the matter and the wealth of the illustration make the reviewer wish that such books had been available when he was studying these subjects, and he can only congratulate modern students in having such a wealth of useful material so readily accessible.

The Opposite Sexes, by **Dr. Adolf Heilborn.** Translated from the German by J. E. Pryde-Hughes. London ; Methuen & Co., viii.+152 pp., 6/- net. It is with some hesitation that we review a book of this character, but we must say that its perusal is extraordinarily interesting. The author begins by referring to the different ways in which women have deformed themselves through the Ages with the idea of being beautiful, culminating in the Wasp Waist of the 18th and 19th centuries, when the skeletal parts were actually deformed by artificial means. The book, presumably more or less appropriately, commences with an illustration of the parasitic male *Edriolychnis schmidti*, where the female of this deep-sea fish develops to a large size and carries out the whole of the functions of the species, the male being a diminuative parasite attached to the female from whom he receives nourishment and everything else. Various peculiarities of women, natural and artificial, in various countries are dealt with in detail, and some of the illustrations in this direction are rather startling. The chapter on the Soul of Woman begins as under, and with that quotation we must leave this work to our readers :—' Woman has no soul and no ego. It is external appearances that make up the ego of the woman. With the female thought is a hurry and a scurry, a superficial sipping of many things to which man, who goes down deep into matters, scarcely gives any attention. She tastes and nibbles and gropes around without a grasp of main factors. And so, the mental activity of woman being a kind of tasting, taste in its widest sense, is the most distinctive feminine quality, the chief attainment a woman can reach, and one which she can bring to a certain state of perfection. This is the description in the modern philosophy by Weininger of the mental and spiritual abilities of woman. This too is, speaking generally, the opinion of Schopenhauer, Eduard von Hartmann, and Nietzsche, modified only by the individual temperament, and point of view of each. Indeed, Nietzsche, in his self-conscious intolerance, went so far as to regard those who held a different opinion as ' typical shallow-pates, shallow in instinct, and generally suspect.' The creator of the Superman added that such persons ' will probably be superficial in all fundamental questions, and never get down to the depth of things.'

EARLY MAN.

In recent years, aided by the daily press, extraordinary prominence has been given to reports relating to the evidences of the occupation of this earth by human or semi-human beings in early times. Each paper seems to have done its best to give importance to news relating to discoveries, or alleged discoveries, and the greater the depth at which any remains have been found, or the greater the number of years which the 'experts' considered the date these represent, the more the papers seem pleased. Naturally, this publicity results in discoveries being made, or rather reported, which ordinarily would be heard little about. Unfortunately, the desire to find something older than anything else recorded, or at a greater depth, has resulted inevitably in the 'evidences' being tampered with. In the pages of *The Naturalist* we have frequently referred to many absurdities which have been published in the press, and sometimes even in scientific journals. In some instances the authors of the errors have admitted their mistakes, but information once given in scientific journals is often accepted by workers who have not seen the subsequent corrections. Another result of all this is the way in which different people seem to feel they are called upon to produce books relating to Early Man, in fact the past few years has seen such an output in this direction that the finding of a new title has been a difficulty, and in some cases authors have adopted titles given by earlier writers to works which are classics, and consequently the 'new' names are misleading.

The press has recently been full of alleged discoveries at Glozel. As the Editor of *Antiquity* pointed out in his December issue, Glozel was first publicly denounced as a forgery in that journal so long ago as March and June, 1927. He still maintains his position and is backed up by a number of archæologists on the Continent, and naturally, as a result of the newspaper controversy that has been going on, attempts have been made to establish the authenticity of the find.

Subsequently to this a special committee, including an English archæologist, has visited the site and examined the remains, and has come to the conclusion that the whole finds are forgeries, the various inscribed and other objects having been made by the son of a neighbouring farmer, inscribed bricks of a somewhat similar type to those which had been buried having been found in and about the kilns of an adjoining brickyard. From more recent press reports it would appear that a French professor, still endeavouring to uphold the authenticity of the Glozel finds, was hissed and mobbed by the students, and had to be escorted from the lecture hall under police protection. In *Discovery* for January, 1928, Mr. Salomon Reinach, Director of the Museum at Saint Germain-en-Laye, has an article headed, 'Why I Believe in the Glozel Discoveries.'

This is, of course, not the first hoax of this kind by any means, as the tales of the 'Billies and Charlies,' of 'Flint Jack,' and others prove.

More recently in *Nature* (No. 3016), two writers whose names we will not mention, one of them at any rate is fairly well-known to our readers, describe some stone implements of Lower Palæolithic Age, found at Sligo in Ireland. These flakes are made of limestone, although chert bands occur in the same deposit. Some of the flakes are said to weigh as much as 36 lbs. each, and one is figured which weighs 12 lbs ! At the time the illustration appeared in *Nature* we expressed the opinion that some of these could not be implements. Since then our surmise, based on the illustrations and on the name of the expert, has proved to be correct, and we find that some of the leading Irish archæologists have written to *Nature* (No. 3027), and stated :—'Although we found some stones which closely resembled in outline those illustrated, careful search in all of the sites failed to reveal a single object which could be accepted as undoubtedly a human artefact of any kind whatsoever, or of any date. There was nothing in any of the sites but ordinary beach material, derived from the splintery rock in the neighbourhood. At Ballyconnell we found two sites agreeing generally with the description given. In each of these the boulder-clay is excessively stony, containing hundreds of thousands of fragments of all shapes and sizes. These are broken with sharp angular fractures, especially in the lower part of the deposit; and it would not be difficult, if any one chose to spend a few hours on the unprofitable task, to collect a large number of fragments bearing a superficial resemblance to artificially formed implements. But having regard to the geological history of the area, and to the nature of the boulder-clay deposits themselves, we could not admit the possibility of any of the stones thus collected being artefacts.' These authors conclude by maintaining a complete disbelief in the authenticity of the alleged discovery.

Correspondence with regard to the Sligo specimens of alleged artefacts has occurred in *Nature*, and apparently the evidence of the local geologists has been such that no reply to the geological aspect of the case has been received. Mr. Burchall retires from the fray. On the other hand, Messrs. Armstrong, M. C. Burkitt, Henry Dewey, D. A. E. Garrod, and Reginald A. Smith state that they are of the opinion that the limestone specimens which they have seen are of human origin, though 'this statement is without prejudice to their cultural age.'

Of books on the subject, we have recently received quite a number in which the Altamira Bison is reproduced (sometimes plain and sometimes coloured); cave drawings of hunters and hunted; impressions of human hands on the walls; Neanderthal Man; The Piltdown Skull and reproductions; and many other well-known examples, as though adding to our general knowledge of this subject.

In **The Stone Age, Mr. E. O. James** (The Sheldon Press, London, 202 pp., 3/6 net.) tells us that 'The greater part of the book should prove easy reading to any person of ordinary education, as no previous knowledge of the subject is presupposed. To put this to the test, I gave my son, who is in his first year at a public school, two of the more complicated chapters to read, and he appears to have found them quite intelligible.' As a frontispiece he gives a copy of the coloured painting of the Altamira Bison. The illustrations, as a rule, are poor, although done by the wife of the author; the Piltdown Man on page 37 is especially bad. Three plates are mentioned in the preface as reproduced from photographs, but one of these (Plate XXXIX.) does not appear to be in the book. The author seems to accept the Maglemose Remains recorded from the Yorkshire Coast as authentic.

In **Days and Ways of Early Man, Dorothy Davison** (London: Methuen & Co., vi.+121 pp., 5/- net.) gives the usual summary in simple language, presumably for the benefit of children. She is bold enough to give dates; for instance, 'The Early Old Stone Age began 1,000,000 to 500,000 B.C.; Late Old Stone Age began 25,000 to 10,000 B.C.; Transition to New Stone Age, 10,000 to 3,000 B.C.; and Neolithic or New Stone Age began 5,000 to 2,000 B.C.' She goes on, however, to admit that 'No reliable dates can yet be given for any of these periods.' The illustrations are numerous, and from the author's own sketches, and include quite a number which also occur in other of these handbooks.

Mary E. Boyle, in a volume entitled **In Search of Our Ancestors** (London: G. G. Harrap & Co., 287 pp., 10/6 net.), backed up with a preface by Abbé Henri Breuil, gives a scholarly account of the La Téne, Bronze, Copper, Neolithic, Palæolithic and various other periods, going down as far as The Secondary and Primary Eras. The Altamira Bison (coloured), Neanderthal Skulls, and many other forms already referred to, appear here as usual. In her chapter on the Tertiary Age she draws attention to the fact that the American scientific expedition to the Gobi Desert noted that camels made quantities of eoliths when on the march. With regard to the 'rostro-carinates,' about which so much is made in some quarters, she says that 'M. Breuil and many others do not consider them man-made,' on the other hand she evidently accepts the Maglemose Harpoons, found in Yorkshire, as genuine. The book is well produced, and the coloured illustrations are admirable.

Donald A. Mackenzie, in his **Footprints of Early Man** (London : Blackie & Son., xviii.+190 pp., 5/-.) seems enamoured by the researches of Mr. Reid Moir beneath the Red Crag of Suffolk, and these are considered to put our study of early human beings back to a period six million years before our era. 'The earliest settlers in East Anglia were thus chipping flint with wonderful skill at a time when there was yet no English Channel, and the waters of the North Sea were as warm as those which wash round the Bahama Island at the present day.' The frontispiece shows Mr. Reid Moir pointing to the spot from which these discoveries were made. The illustrations to the book are of the type already mentioned, and among them are several relating to the Glozel discoveries, where in addition to the bricks with hieroglyphics, etc., the author gives a comparative table of Egyptian, Hieratic, Phœnician, and Glozelian Letters. In addition much space is given to the description of these relics, with different opinions thereupon, and the author concludes, 'But Glozel remains a mystery.' We think the word 'hoax' might reasonably be substituted for 'mystery.'

A further volume, dealing more particularly with a definite area, is entitled **The Antiquity of Man in East Anglia,** by **J. Reid Moir.** London : Cambridge University Press, xiv.+172 pp., 15/- net. In this the author tells us that the results of his various researches have been gathered together, blocks have been borrowed from a number of sources, and in some cases an entire chapter has been reprinted from another publication. There is no doubt as to the authorship of this book, as his name is repeated on a large proportion of the pages, sometimes as many as five times in five lines, which we do not think could possibly have occurred had it been written by any other hand. However, we are rather relieved to find that the author's portrait does not appear as frontispiece. In his fourth chapter he deals with East Anglians of 500,000 years ago, including an illustration of a so-called Rostro-carinate. When the Cromer Forest bed is described 'about 400,000 years ago great events were taking place in Norfolk.' Among the illustrations are quite a number which are more than suspicious. On Plate VII., for instance, is a piece of wood such as can be picked up in hundreds in almost any peat-bed, and which without any reason at all is dismissed with 'A Piece of Humanly-shaped Wood from Cromer Forest Bed, which, *in my opinion* was shaped by man.' Similarly, Plate V. contains an illustration of bones, slightly pointed, which are described as 'Two pieces of humanly-shaped bones from beneath the Shelly Red Crag, Suffolk.' Almost precisely similar pieces occur in some numbers among the bones from the Hyæna Den at Kirkdale Cave and other places, but in these instances they are described, we believe quite correctly, as the remains of hyenas' feasts. On Plate XIV. is figured a quartzite pebble upon which an outline of a 'goat' has been marked in. It so happens, as already pointed out in *The Naturalist,* we have handled and examined this pebble, and there is no question whatever that it is an ordinary pebble such as occurs on the fields in thousands, containing marks which with a bit of chalk and and imagination might be likened to a prancing goat. On the other hand, it could just as easily be a sprawling star-fish, or, if turned upside-down, as we have put it, a ghost ! Even the finder admits that the rock is harder than flint, and, therefore, could not be scratched upon by that material. The way in which Palæolithic animal remains are reproduced is further illustrated by the specimens on Plate XIX., which the present writer challenged when they were first described, and Sir Ray Lankester, who was present, publicly admitted that the sketches on the flints as filled in with white Chinese ink certainly more nearly represented the animals than when he saw them before the ink had been applied! On Plate XIV. is an illustration of the now famous piece of Chalk Ammonite which was originally described as a statuette of a mammoth, the siphuncle even being referred to as a certain anatomical detail referable to the male. In this Journal we pointed out the natural character of this specimen, and later, in *Man*, the late Sir Henry Howorth did the same, illustrating other similar forms. Even Mr. Reid Moir himself said that at first he thought the whole of the present form was due to human-shaping, but that the late Dr. Charles Andrews pointed out it was probably the internal cast of the chamber of an ammonite. Notwithstanding all this, Mr. Moir naturally concludes 'I think, nevertheless, it should be placed on record as a highly possible example of the art of Late Palæolithic Man. The specimen was subjected to a very searching examination *by me, and the above is my considered opinion upon it.*' Another of Mr. Reid Moir's bubbles is described in detail as the Ipswich Skeleton, which, when first found, was sat upon, as it were, by a whole army of scientific experts, who, led by Mr. Moir, opined that it was pre-Boulder Clay in date, and the bones were sent to Sir Arthur Keith, who referred to them in his book on 'Early Man in Britain' as probably the oldest human remains in the British Islands. Since then Mr. Moir himself has admitted that he had mistaken the hill wash for true Boulder-Clay, and has withdrawn his first description. Sir William Boyd Dawkins contended that the skeleton was comparatively modern.

Notwithstanding this, the new book has pages and several illustrations of this alleged early Ipswich man. When we come to more modern antiquities we find the author is similarly unreliable. On Plate XXII. he figures an unquestionably Bronze Age Beaker, though he describes this as ' Neolithic or *Late* Bronze Age.' In the text facing the illustration he describes it as belonging to ' the end of the Neolithic period, or *beginning* of the Age of Bronze.'

Dealing with the same area, simultaneously has appeared the Geological Survey Memoir on **The Geology of the Country Around Ipswich,** by **P. G. H. Boswell.** London : H.M. Stationery Office, 1927, x.+121 pp., 3/6 net. In this, quite properly, primary importance is given to the geological features of the district, and naturally we look upon a geologist as much more likely to be serviceable to us in deciding questions of relative age of human remains than one without geological knowledge. Of that part of the work dealing with solid geology there is nothing but praise. When, however, we come to the chapter dealing with Early Man, we find that in this Geological Survey Government publication the researches of Mr. Reid Moir predominate. Reference is made to the Pre-Palæolithic Rostro-carinates in this connexion, and yet we read that ' Although many archæologists and a certain number of geologists have now accepted the workmanship as human,' many others have been unable to do so. In coming to the Chellian implements we are also informed ' It should be mentioned, however, that some difference of opinion exists as to the human origin of the fractures on these glacial flints.' Under Acheulian, after describing the work of Miss Layard and Mr. Reginald Smith, we are told, ' Despite all this work, the significance of the succession and its relation to deposits containing the Lower Mousterian culture remained in doubt.' Under Mousterian the notes begin that opinions are divided, and it is definitely stated that one authority does not believe in the examples being of human workmanship. With regard to human bones found, Sir Arthur Keith thinks they must be assigned to a modern type of man. The fauna of one deposit is admittedly unusual, containing a mixture of ancient and modern forms, and so we go on, and the more we go on the more we seem to have cause to flounder. What we should have liked in an official Government publication would have been an official statement as to whether, in the opinion of the Survey, the flint specimens are, or are not, of human workmanship, and whether they are, or are not, of the ages which is attributed to them by the archæologists. The clarity of the problem is not aided by the statement on page 71 that 'the flint implements found in bed 7 are described on page —,' the particular page in question being left blank !

The Clarendon Press at Oxford has issued four volumes by **Harold Peake** and **Herbert John Fleure** (a happy combination), relating to the history of man from the earliest of times. The first deals with **Apes and Men** (vi. + 138 pp., 5/- net.), and in it we have the usual figures of the Gray's Inn Lane implement, the skeletons of apes and men, Rostro-carinates, and many others which are familiar to students of this interesting topic. With regard to the Rostro-carinates the authors tell us that ' The discovery of this new type of tool was received with some scepticism by archæologists, but the new implements received the powerful support of Sir Ray Lankester, who read a paper on the subject before the Royal Society. Similarly shaped flints were found in 1913 at Selsey Bill, in Sussex, by Professor Sollas, who regarded them as due to natural causes. MM. Breuil and Boule examined Mr. Moir's specimens, but rejected the idea of human workmanship. Early in January, 1919, Mr. Moir examined a pit at Foxhall, near Ipswich, and there found, at a depth of sixteen feet, and several feet below the top of the Red Crag, yet thirteen feet from its base, a layer containing burnt flints, potboilers, bones, and flint implements for boring and scraping. M. Breuil visited the site the following year and examined the flints and expressed himself convinced that they were definitely of human workmanship. Lastly, in 1921, Mr. Moir described a number of implements, which he considered to be of early Chellean type, which he had found on the foreshore at Cromer, and which, he believed, came from the Cromer Forest beds. In December of the same year, M. Capitan wrote in Savoir that both he and M. Breuil were prepared to accept as of human workmanship the flints of the Cromer Forest bed and the Red Crag, including those found at the base of the Crag, as indubitable evidence of the existence of man in the Pliocene epoch. M. Boule, however, so far has declined to express a definite opinion on the subject. There are many others, not only in France, but especially in this country, who are extremely sceptical of the human workmanship of these flints.' It will thus be seen on this very vital point these authors are not at all definite. In **Hunters and Artists** (vi.+154 pp. 5/- net.) the narrative is continued, and we have nine chapters relating to The Retreat of the Ice ; Changes in the Coastline ; Tundra, Steppes, and Forest ; Late Palæolithic Industries ; Early Types of Modern Man ; The Life and Thought of the Times ; Palæolithic Invaders of Europe ; Chronological Summary. With regard to the Maglemose Harpoons from Holderness the authors are cautious, but the whole question rests on their word '*if*.' The volume contains the familiar illustrations of cave paintings ; Hands in the Castillo Cave ; the Bulgy Lady from Barma Grande, and other familiar objects. With regard to the Ipswich Man, which is given among a list of the late Palæolithic skeletons, the authors consider that its age is 'very doubtful.' In **Peasants and Potters** (vii. + 152 pp., 5/- net.), the third of this series, reference is made to the people inhabiting the valleys of the Tigris, Euphrates, and the Nile, and the advance made made in their art. A wonderful series of illustrations in this volume demonstrates the progress made in the art of pottery, and we have the familar ivory figure of Badarian culture, and others. Finally, in **Priests and Kings** (208 pp., 5/- net.), an idea of its scope may be obtained by the following titles of chapters : The Discovery of Metal ; Systems and Chronology ; Sumner and Akkad ; The Old Kingdom of Egypt ; Early Minoan Times ; The Ægean World ; The North Kurgan at Anau ; The Peasants of the Danube Basin ; The Valley of the Alt ; The Black Earth Lands ; Chronological Summary ; and The Races of the World. As with the previously mentioned books the illustrations are well selected, and besides the samples of pottery on various forms there are maps, diagrams, sections, etc. ; the statue of the Sheikh-el-Beled ; Workmen drilling out stone vessels ; the Pyramids, also appear here.

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Water Plants : A study of Aquatic Angiosperms, by **Agnes Arber.** London : Cambridge University Press, xvi.+436 pp., 31/6 net. Mrs. Arber has long been recognised by the scientific world for her botanical researches, and situated as she was at Cambridge, she had exceptional opportunities of studying river and fenland plants, and at the suggestion of her late husband, another well-known botanist, these researches were carried out, and to him the book is dedicated. Naturally, the microscope plays an important part in connexion with researches of this character, and of these every possible record has been taken. There are 170 illustrations, but as many of these contain quite a large number of sketches, it will be seen that pencil as well as pen has been well occupied. While the book was published some time ago it does not seem previously to have had a notice in this journal, and the excellence of the work warrants us in drawing the attention of our botanical readers to a book full of brilliant suggestions, and the result of sound scientific study.

In Memoriam.

EDGAR RAVENSWOOD WAITE.*

A REUTER'S message from Hobart (Tasmania) announces the death of Edgar Ravenswood Waite, the naturalist, and director of the Adelaide Museum, who went to Tasmania as delegate to the nineteenth congress of the Australasian Association for the Advancement of Science.

He was a Leeds man. After leaving the old Leeds Middle-Class School he was for a time at the Yorkshire College under Professor Miall, whose books he assisted in illustrating. Following a brief period in the Leeds Borough Accountant's office he became curator at the Leeds Philosophical Hall (now the Leeds City Museum). In 1893 he went to Sydney, Australia, and for about a dozen years was zoologist at the Museum there, afterwards going to Canterbury Museum, New Zealand, as curator. For the past ten years he had been director of the Government Museum at Adelaide, S. Australia.

He went on several expeditions to the Antarctic, where there is a mountain bearing his name, and wrote the section on fishes in the books describing the Shackleton and Mawson expeditions, as well as the standard book on the snakes of Australia.

During a visit to the Auckland Isles, he formed one of the party which rescued the survivors of the Norwegian barque, the *Dundonald*, after they had suffered acute privations for over nine months ; their only food during that period had been the flesh of the seal and albatros, and a few roots. During the war, he visited the mandated territories in the Pacific, including German New Guinea and the Bismarck Archipelago, now known as New Ireland and New Britain. He made extensive collections , and studied the habits of the natives. On one of his trips to the interior of Australia he followed part of the trail of the famous explorers, Burke and Wills, who were the first to go into the central part of the Continent.

After 35 years' residence in the Antipodes he returned to Europe in 1926 and was entertained at a gathering of the masters and old boys of the Leeds Middle-Class School, and by the Leeds Luncheon Club. His visit was an official tour of inspection of the museums of Europe. He afterwards went to America, on the invitation of the U.S.A. Government, to advise on the arrangement of Antipodean specimens. He has written over a hundred scientific papers and several books on natural history.†

Mrs. Waite is a Leeds lady, the daughter of Mr. Green, who was formerly associated with the Leeds Rifles.

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* From *The Yorkshire Post*, January, 1928.

† We published his portrait in *The Naturalist* for September, 1926, page 257.

RICHARD KEARTON.

By the death of Richard Kearton, Yorkshire loses one of her distinguished sons, who had an international reputation as being the best type of field naturalist.

He came from good old Swaledale stock, and were it not for an accident which occurred when he was a boy, which dislocated his left hip and left him permanently crippled, he might have remained a Swaledale farmer all his life. The accident, unfortunate in a way, was for naturalists a really fortunate occurrence, for had it not happened the study of wild life would not have reached the position it holds to-day. The present status of nature photography and its study, without the aid of the gun and the trap, is entirely due to Richard Kearton. Some of us were probably struggling at the game before him, but it was not until, with his extreme patience and cunning contrivances, freely given to the public in his popular book, that we had a measure of success.

Apart from his wonderful books, which opened out a new world to the public and created quite a sensation when first issued, he was always ready in the kindest manner to help his fellow naturalists and photographers ; such a thing as jealousy did not enter into his composition, and he always took pains to give anyone the fullest credit due to them, which is more than can be said about some lecturers upon wild life.

R. Kearton has lectured in most towns of importance in the kingdom. His lectures were wonderfully popular, and his continual reappearance, year after year, on the same platform, testified more than anything else to his great popularity.

His patience and kindness, which enabled him to make friends with hosts of wild creatures, endeared him to everyone. Naturalists in general, and particularly that large and continually growing, enthusiastic band of his disciples, the wild life photographers, will sorrow greatly for his loss, for he was in every way an inspiration for them.

He was a member of the Zoological Photographic Club, and about a year ago was elected an Hon. Life Member (the only one) as an appreciation of his work in nature photography.

About two years ago a serious illness brought his active field work to an end. Writing to me when he had recovered to some extent, he said he was looking forward to trying conclusions once again with the Swaledale trout, but unfortunately this was not to be.

He suffered very greatly towards the end, but his passing was very peaceful. He was, as anyone who knew him would expect, brave and patient throughout, and to the last his thoughts were for others and not himself. The writer, in common with thousands of others, looses a very old and valued friend. May he rest in peace.—R. F.

NEWS FROM THE MAGAZINES.

J. Delacour writes on 'Ducks' in *The Avicultural* Magazine for January.

Three new British Aphides are described in *The Entomologist* for January, by F. V. Theobald.

The Medical Herbalist for January contains a record of a botanical ramble to Bell Busk in 1870.

The principal paper in *British Birds* for January deals with the birds of the South Lancashire Coast.

British Coccidæ and Thysanoptera are dealt with in *The Entomologist's Monthly Magazine* for February.

The death is announced of E. K. Robinson, formerly Editor of *The Countryside*, and other 'popular' natural history publications.

A note on the Herring Gull, 'perhaps the most characteristic of all Manx Birds,' appears in *The Journal of the Manx Museum*, No. 12.

The Scottish Naturalist, No. 168, contains an account of the remarkable invasion of a school of the False Killer in Dornoch Firth last October.

Mr. R. S. Bagnall describes several new genera and new species of Thysanoptera in *The Annals and Magazine of Natural History* for December.

A well-illustrated article on 'The Antiquities of Agriculture,' by H. G. Richardson, appears in *The Journal of the Ministry of Agriculture* for December.

Sir David Prain's Presidential Address to the Quekett Microscopical Club, on 'The Reactions of Science on Affairs,' is printed in No. 93 of the Club's *Journal*.

In *The Geological Magazine* for February, Mr. L. R. Wager has a paper on 'A Metamorphosed Nodular Shale previously described as a "Spotted" Metamorphic Rock.'

An illustration from a photograph of the painting by Mr. Roland Green, of Shelducks on the Norfolk Coast, appears in the Winter number of *Bird Notes and News*.

The Marquess of Tavistock describes 'Foreign Birds at Liberty in Great Britain'; and Frank Finn, 'The Dodo and Solitaire in Aviculture,' in *The Avicultural Magazine* for February.

Antiquity for December contains a paper on 'The Climate of Prehistoric Britain,' by C. E. P. Brooks, which contains references to the peat deposits, etc., in the North of England.

W. J. Lucas refers to 'British Orthoptera (including Dermaptera) in 1926,' and also gives 'A List of the British Orthoptera, including Dermaptera,' in *The Entomologist* for December.

The specimen of *Avocettina infans*, recently figured in *The Naturalist*, is reproduced in *The North-Western Naturalist* for December, together with some notes on this rare deep-sea fish, by Mr. H. E. Forrest.

Mr. T. S. Ashton's paper on 'Coal Mining in the Eighteenth Century,' read to the Leeds meeting of the British Association, appears *in extenso* in *The Queensland Government Mining Journal* for November 15th.

In *The Geographical Journal* for January, Sir George Fordham prints his paper on 'Some Surveys and Maps of the Elizabethan Period remaining in Manuscript, Saxton, Symonson and Norden,' which was read at the Leeds Meeting of the British Association recently.

Progress, the illustrated magazine of Messrs. Lever Brothers, for January, has an article on 'The Educational Value of Museums,' by L. S. Davison, the Curator of the Lady Lever Art Gallery, Port Sunlight, though the title would have been more accurate had it been 'The Lady Lever Art Gallery.'

1928 Mar. 1

CORRESPONDENCE.

ANTHRISCUS SYLVESTRIS HOFFM.

Further to my note as to a local name applied to the sbove plant in the Huddersfield District (*The Naturalist*, December, 1927, p. 348) I have since examined a collection of dried plants, chiefly collected in the York District, by the late Christopher Metcalfe, in 1884, presented to the Tolson Memorial Museum, Huddersfield. Among these is a sheet of blossoms of *Anthriscus sylvestris* Hoffm. simply labelled 'Stepmother Blossom.' Is this local name still in use in the York District?—W. E. L. Wattam, Newsome.

—:o:—

NORTHERN NEWS.

Mr. J. L. Strafford, at one time President of the Hull Scientific and Field Naturalists' Club, and a well-known East Yorkshire naturalist, died early in January, at the age of 73.

Two excellent photographs showing fasciation in a sapling of the Common Ash (*Fraxinus excelsior*), occurring in a hedge at Low Brockholm Farm, near Danby Wiske, have been sent us by Mr. John E. Nowers.

'Don't eat too much. Be temperate in all items. Three meals a day are enough. Don't eat pickles instead of fresh green salads. Don't drink during meals. Don't drink boiled milk.' These and many other instructions are given in the Sunderland Public Museum.

At a recent meeting of the Geological Society of London, the President (Dr. F. A. Bather) exhibited breccia containing silver coins of Edward I., dug up from the bed of the River Dove (Derbyshire), and figured on the title-page of Mantell's 'Wonders of Geology.' 1838.

We have received the following reprints from Mr. Hans Schlesch:—'Nachtrag zu Ueber Abnormitaten der Farbung der Windungsrichtung und der Gehausebildung bei den Clausiliiden'; and Bemerkungen uber Geyer's 'Unsere Land under Susswassermollusken,' 3. Ausgabe.

The Lloyd Library at Cincinnati, Ohio, has published as its Bulletin No. 26, 'The Genesis of the American Materia Medica,' including a biographical sketch of John Josselyn, Gent, and the Medical and Materia Medica References in Josselyn's 'New-Englands Rarities Discovered,' etc., and in his 'Two Voyages to New-England,' with critical notes and comments by Harvey Wickes Felter, M.D.

We learn from the press that 'Hunting rats in trees is the latest sport at Thorne. Driven from their holes by the floods, hundreds of rats have taken refuge in trees, choosing those near a refuse tip. On Saturday, villagers went out with sporting guns and shot many of them, but the survivors showed no inclination to move. However, after another round of "drum-fire," they retreated in disorder.'

Our contributor, Mr. Hans Schlesch, who has presented some thousands of specimens of mollusca, including land, freshwater and marine species, from all parts of the world, to the Hull Municipal Museum, has been elected an Honorary Life Member of the Yorkshire Conchological Society. This took place at a meeting of the Society, held at Leeds on January 14th, and was in recognition of his many valuable contributions to European Malacology.

The Boston (Lincolnshire) Waterworks Company has decided to purchase 37 acres of land from the Stanhope estate for the extension of their works at Revesby, at a perpetual rent charge of £75 per year. Two independent water diviners have visited the district on different dates unknown to each other, and with the aid of hazel twigs have pronounced water to be present in adequate quantity. What we should like to know is what the Boston (Lincolnshire) Waterworks Company will say if it should so happen that the independent water diviners have made a mistake, as is quite possible, and the Company have to pay a perpetual rent charge of £75 per year for nothing.

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NOTES AND COMMENTS.

ABNORMAL PINK-FOOTED GOOSE.

At a recent meeting of the British Ornithologists' Club ' Dr. G. Carmichael Low showed the foot of a Pink-footed Goose (*Anser brachyrhynchus*), which had been sent to him by Mr. Edward Valpy. The bird was recently shot on the Humber and presented a very abnormal condition of the web of the foot. This was entirely absent between the toes, with the exception of a slight thickening along the side of each toe down to the base of the nail, where the web naturally ends. There was no evidence of any traumatism to account for the condition, and one must conclude, therefore, that it was a congenital defect. There was no account of the other foot. (Since writing the above, Mr. Valpy has obtained the other foot, which is exactly the same as the one exhibited.) '

NOMENCLATURE.

From the ' Bulletin ' containing the previous information we read the following : ' In the " Bulletin," No. CCCVIII. Nov., 1926), Professor Sushkin described a new form of Tibetan Partridge as *Perdix hodgsoniæ occidentalis*. Dr. C. B. Ticehurst pointed out to Prof. Sushkin, however, that the name was preoccupied, and accordingly the latter changed it to *Perdix hodgsoniæ nanshanicæ* in the October number (vol. xlviii., 1927, p. 27). In the meanwhile, Dr. Albert Collin had noticed Prof. Sushkin's mistake, and in the " Ornithologische Monatsbericht " for March, 1927 (xxxv., p. 55), proposed to substitute the name *Perdix hodgsoniæ koslowi*, which, unfortunately, is the name the bird must now be known by. A needless addition to synonymy might have been avoided if Dr. Collin had followed Dr. Ticehurst's example and, instead of rushing into print, drawn Prof. Sushkin's attention to the mistake.'

AN UPPER WHARFEDALE BIRD.

Under the heading of ' The Golden Eagle in Yorkshire,' the following note appears in a recent issue of *The Yorkshire Weekly Post*, accompanied by a photograph of a Golden Eagle in a case, which apparently is the bird in question. The Golden Eagle figured, however, was obtained in 1902, near Kettlewell, and with it is shown the man who killed the bird with a stick, as he then was. 'The identification as a Golden Eagle of the large bird recently killed in Lincolnshire was quickly followed by the appearance of a huge bird in the Settle district of Craven, which, from descriptions supplied by eye-witnesses, is surmised to have been a Golden Eagle. *If* that surmise be correct, the Settle bird is the first authenticated case of a Golden Eagle having been observed in our county for some twenty-six years. The last previous visitor of this species, a small one as Golden Eagles go, came to a melancholy end in Upper Wharfedale in, I think, 1902. It was first seen on the moorland shoulder of Great Whernside by a gamekeeper, who, on approaching, was surprised to see the great bird rise into the air with a steel trap attached to one of its feet, from which dangled the length of chain that had originally tethered the trap to its peg. He shot at it, but missed, and the unhappy bird disappeared across the dale.'

UNCANNY.

'A day or two afterwards a river-watcher was serenely strolling along the riverside in the course of his duty, when he was startled by hearing what sounded like the clanking of chains overhead. Naturally one does not look for such ghostly manifestations as aerial clanking of chains when engaged in peaceful rural pursuits, and the experience was a trifle uncanny. However, looking up, he espied a huge bird perched in a tree, the steel trap and chain still attached to its foot, and he hurried across to a neighbouring farm to borrow a gun. The bird was dislodged, but was so enfeebled that it had little power of flight left in it, and the rest of the proceedings was in the nature of a short chase, which ended in, if my memory serves, the wretched victim being put out of its sufferings with a stick. The bird was reported to have damaged a dog by mauling it.' From enquiry we have made to competent authorities, it would seem that the bird found in the Settle district is, in all probability, a dark form of the Common Buzzard, and not an eagle at all; and it also turns out that the damage to the dog, which has been credited to the alleged Golden Eagle, was evidently due to it being burnt by a red-hot iron, or acid, and has nothing to do with any other animal than man.

ANTS.

As 'Psyche Monographs, No. 1,' has been published 'The Origin of Instinct: A Study of the War between the Ants and the Termites,' by E. Bugnion,* the monograph having been translated by C. K. Ogden. Dealing with the subject from the point of view of the naturalist, the author certainly gives a fascinating story of the peculiar history of the Termites and their various defence measures. Chapters follow on Evolution of Instincts Connected with Defensive Measures Borrowed from Nature; Instincts in Connection with the Anatomical Structure and Evolution of Defensive Organs; and Instincts Resulting from Mental Dispositions which have

---

* London: Kegan Paul, Trench, Trubner & Co., 44 pp., 5/-.

Proved Useful for the Conservation of the Species and have Gradually become Automatic ; and Differentiation of Workers and Soldiers. The book is well illustrated and produced.

ECONOMIC GEOLOGY.*

Probably more than with most sciences, Geology lends itself to the service of mankind. The Fuels (solid and liquid) Water Supply, Fertilizers, Building Materials, are some of the ways in which the strata of the earth can be put to service, in addition to which engineers require geological knowledge in connexion with the construction of railways, roads, canals, the building of bridges, protection of the sea coast, and in other ways. Few persons have had a wider experience in these matters than has Professor Gregory, the author of this work, and by the aid of over 60 diagrams and maps he deals with ores of various kinds ; clays ; building materials and soils ; water supply ; coast defence, and so. The professor's extensive experience as an author and lecturer makes a perusal of his book anything but a dry operation.

FAKES 3000 YEARS AGO.

We learn from *Nature* that ' In the *Chemiker-Zeitung* of December 31st, Prof. Neumann gives an interesting account of some analyses which he has recently carried out of fragments of Babylonian *artificial* lapis lazuli, dating from about 1400 B.C., from the excavations at Nippur. The high percentage of lead previously found by Bertrand has been shown to be quite erroneous, but it has been conclusively established that both cobalt and copper are present as colouring matters. It is claimed that this is the only antique glass which is definitely known to be coloured by cobalt, for in spite of frequent references in technical literature to the existence of this metal in antique glasses, they appear to have no justification. Their origin has now been traced to a faulty observation published by Davy in 1815. Although many specimens of antique glasses from the period between 1500 and 850 B.C. have been analysed by Neumann and his collaborators, cobalt has hitherto never been detected in them.'

THE POET AND THE FLOWERS.†

' If you have the great fortune to live in the country, waste no envious thoughts on those who live in cities ; hasten to gather to yourself the wealth which Nature holds out to you. Give your ear to the call which the thrush pours forth in the spring-time ; bend long over the mystery of fragile new-born things ; give a welcome to the little leaf-blade peering out of the soil as it adventures into the world of light ; catch before it goes the glint of the dewdrop on the gossamer web ; watch the changing light on evening fields ; see how noble is the arching of the heavens, what depth there is in the blue, what softly gleaming liquid purity in the clouds, what wonder in the unfathomable remoteness. Take all the loveliness, the feeling, the poetry of Nature into your heart and wrap them round with love.' Such is an introduction to a charming little volume of poems selected by our contributor, Miss Johnstone, among them being quotations from Tennyson, Keats, Shelley, Scott, Burns, Wordsworth, Coleridge, Shakespeare, Milton, and Chaucer, though there are several from other authors, and there is a fine chapter in conclusion which will be found of great service to the young reader for whom the volume has been prepared.

---

* ' The Elements of Economic Geology,' by J. W. Gregory. London : Methuen & Co., xv.+312 pp., 10/-. net

† By Miss M. A. Johnstone. London : Blackie & Son, x. + 86 pp., 2/6 net.

A SHORT HISTORY OF LINCOLNSHIRE.*

This volume is very much on the lines of the well-known county geographies issued by the Cambridge University Press. It contains a Foreword by Lord Yarborough, who refers to the *Viking* boat found at Brigg, which he *believes* was eventually taken to Hull. A little further on the author himself refers to the same specimen as of the New Stone Age, and definitely states that it is now in the Hull Museum. An illustration of a pre-Roman shield in the middle of the chapter on Romans in Lincolnshire is misleading. There are chapters dealing with Romans, Beginnings of Christianity, Danes, Normans, Domesday, Towns, Monasteries, Churches, Gilds, Pilgrim Fathers, Civil War, Farming Methods, and so on. These are increased tremendously in their interest by the reproduction of contemporary illustrations, as well as by blocks from modern photographs. It is gratifying to the present writer to find to what a large extent the specimens in the Hull Museum have contributed to the illustration of the work, though the source of some of these is not apparent in the book. Presumably the volume is written for use in schools, and for this purpose it is admirably suitable. The Earl of Yarborough, at any rate, was very pleased to read it.

LIVERPOOL BIOLOGISTS.

The Proceedings and Transactions of the Liverpool Biological Society (Vol. XLI.) have been received, and not withstanding the heavy cost of printing, etc., the volume is attaining its pre-war dimensions. In Dr. Johnstone's General Report there are five papers dealing with ' Plankton of the

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* By Charles Brears. London & Hull : A. Brown & Sons, Ltd., xi.+216 pp., 3/6 net.

Plaice Spawning Ponds at Port Erin,' by A. Scott; 'The Cirripede Fish Parasite, *Anelasma squalicola*,' by J. Johnstone and Winifred Frost; 'The Muscular System of the Shrimp,' and 'Hydrographic Investigations in the Irish Sea,' both by R. J. Daniel; and 'Some Fish Diseases,' by J. Johnstone. In addition, there are Mr. S. T. Burfield's Presidential Address on 'The Spiral in Nature'; 'On the Casting of the Shell in *Limulus*,' by W. S. Laverock; and 'The Marine Biological Station of Port Erin,' being the Fortieth Annual Report of the Liverpool Marine Biology Committee, now the Oceanography Department of the University of Liverpool, by Professor James Johnstone. Bound up with the volume is the L.M.B.C. Memoir, XXVIII., on Sagitta, by S. T. Burfield, which has the usual wealth of illustration and perfection of detail.

THE ANGLO-SAXONS IN ENGLAND.*

In 1924 the author visited England and carefully examined and sketched the various Saxon remains in the principal museums in the country. As a result this work has appeared, and the various Anglo-Saxon relics found in the country have been classified, described, and illustrated in a way which it seems sad to think should have been left to a colleague in Sweden to accomplish. As illustrating the wealth of material and the thoroughness with which it has been dealt with, the chapters are headed, The Oldest Anglo-Saxon Finds in England; Saucer brooches, Cruciform brooches; Long brooches with triangular or shovel-shaped foot; Brooches with downward-biting animal heads between bow and foot; Foreign antiquities; Round brooches; Buckles and strap-mounts; Pendants; Garnet-decorated ring-brooches, spoons, pins, and buttons; Swords; Miscellaneous finds from the seventh century; Anglo-Saxon chronology; Anglo-Saxon ornament; and Transition to Irish Style. The volume is exceedingly cheap, and we can recommend it to all students of early English history.

GEOLOGICAL SURVEY MAPS.

Recently published Maps include Nos. 139 (Stafford), 4 (Holy Island), 76 (Rochdale), and 207 (Ipswich). In distinctness and excellence of the colouring, they maintain the high standard of recent productions of the Geological Survey. Of special interest to north-country workers are the Rochdale sheets (Solid and Drift), where the application of recent researches on the distribution of goniatites has allowed the surveyors to produce a map, the detail of which

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* By Nils Aberg. Cambridge: W. Heffer & Sons. viii.+219 pp., 12/6 net.

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would be difficult to surpass. Comparison of this map with the original edition emphasises the value of this new criterion of mapping. In the Drift Map, this detail is naturally omitted, but an interesting innovation is the insertion of the more important overflow channels, in which the area is particularly rich. Additional vertical sections, both in the Rochdale and Holy Island sheets, giving more detailed stratigraphical information, render the maps of the greatest possible value to workers in the formations in question, as well as those concerned in the mineral resources.

EARLY HULL WHALING.

An old friend of ours, Mr. A. H. Patterson, writes :—'I saw an old volume, "The Provincial Literary Repository," for the year MDCCCI, Spalding. In it I found the following. "There is not, perhaps, in the annals of the whale fishery, an instance of such great success as the following, which has occurred this season : Eleven ships, belonging to the port of Hull, took, in Davis Straits and the adjoining seas, 128 whales, in the course of a little more than a month. Reckoning each of these whales to produce about 30 butts of blubber, which may be considered as a moderate computation, the whales of those seas being considerably larger than what are taken in Greenland, the cargoes of these eleven ships will amount to 3840 butts of blubber, which, at the rate of three butts to one ton of oil, will yield, in the article of oil alone, a clear gain to the country of £44,800."'

YORKSHIRE HERONRIES.

A census is being taken this season of the number of herons nesting in the country. It is particularly desired that this should be very thorough as far as Yorkshire is concerned. During the last few years the distribution of these birds has been considerably interfered with ; old heronries have been deserted and new ones established. In some cases the new ones consist of a small number of birds, and some are in out-of-the-way places. It is very desirable that these should be recorded. Will any reader of *The Naturalist* who is able to assist, write to Riley Fortune, Moorlands, Harlow Hill, Harrogate, who has charge of the Yorkshire Section, for particulars and schedules.

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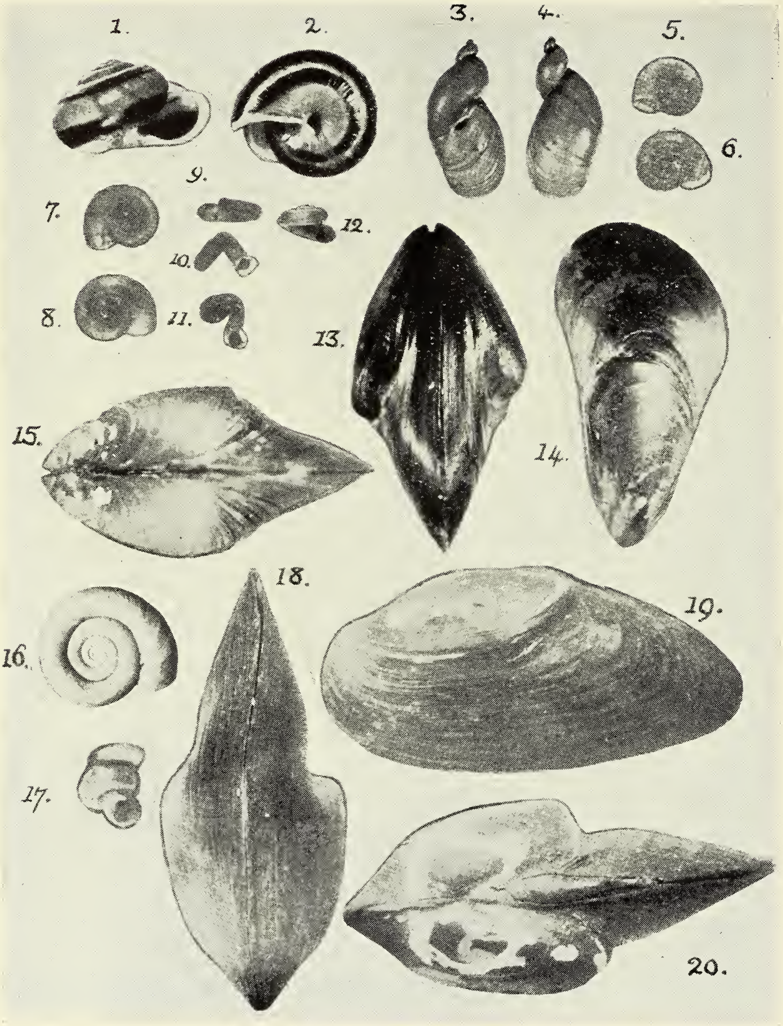
The Transactions and Proceedings of the Perthshire Society of Natural Science, Vol. III., Part 4, just to hand, contain a paper on 'The Geology and Scenery of Cornwall,' by Henry Coates, which is well illustrated. There is an important contribution dealing with 'Recent Additions to the Perthshire Plants,' by J. R. Matthews,' and 'Additions to the Conchological Collections in the Perthshire Natural History Museum,' by Henry Coates.



Some Rare Forms of Mollusca.

SOME RARE FORMS OF MOLLUSCA.

HANS SCHLESCH,
Copenhagen.

PLATE II.

MOLLUSCAN monstrosities are always of especial interest, and although they are often to be found in collections, it is not often that we find them described in the scientific press. I therefore propose to give the following notes on some unusual forms, which are now to be seen in the Schlesch Collection in the Natural History Gallery of the Hull Municipal Museum.

Planorbis planorbis L. forma *major.*

During my visit to Budapest in September, 1927, I noticed in the collection of Dr. R. Streda some gigantic specimens from Székésfehérván, in Hungary, and Dr. Streda was kind enough to let me have his largest specimen, measuring in diameters 26 mm., certainly the largest example of this species hitherto noticed. (Fig. 16.)

Cepæa hortensis (Müll.) forma *perforata* Westl.

Westerlund described this 'variety' from Wamblingo Church, in Gotland, found on *Juniperus communis* L. As shown on the figure, this possesses an umbilicus just as we find in such species as *Helicella itala* L. I have not been able to trace whether the form still occurs locally in the Isle of Gotland, or whether only a few specimens have been found; but in other places it seems to be very rare, only as far as I can gather, by Crowther from Tadcaster, in Yorkshire, by Goldfuss from Coburg, in Thuringia, and by Tidemand-Rud from Björnsborg, near Kragerö, in Norway. Mr. B. Sundler informs me that he possesses one example, probably collected at Kinnekŭlle, Sweden. My specimen was found by J. Hjort in Aalykkeskov, near Odense, in Funen, in July, 1926. Dr. Cæsar R. Bœttger, working especially in this group, told me that it was the first specimen he had seen.

Succinea putris (L.) *scalaris* Schlesch.

It is remarkable that perfectly scalariformed specimens seem not hitherto to have been noticed in this very variable species. As far as I see, only Baudon figures a specimen, the last whorl of which was separated by a deep suture; and between other species of *Succinea* Hazay figures a specimen of *S.* cf. *pfeifferi* Rossm., also a juvenile, *S. elegans* Risso, by Baudon, collected by Fagot. My specimen was obtained in Ermelunden, near Copenhagen, and, as is shown on my figure, perfectly scalariformed.

Mytilus edulis L. monstrosity.

Monstrosities between this species are surely not scarce. My 'double-shelled' specimen is from Blaavandshuk, in West Jutland, and has been kindly presented by Mr. H. Muckardt, in Helsingborg. Another specimen, with nine distinct and successive margins to each valve, was collected in Flensburg Fjord, and presented me by Mr. H, Plamböck.

Gyraulus gredleri Bielz., monst. *scalariforme*.

It is well known that deformities are often observed on the Planorbidæ. Many explanations have been given, but it is yet not fully understood. It seems, however, that such scalariformed specimens, as a rule, occur in small ponds and canals with much growth of *Lemna*, and it was supposed that this was the reason ; but it seems, on the other hand, to be owing to parasitic influence. Locally scalariformed specimens have been noticed, t. exp. of *Planorbis planorbis* L. in a small pond at Magné, in Belgium ; *Spiralina spirorbis* L. by Stubbs, from a small ditch near Tenby ; and Mr. John W. Taylor records 'a very large number of curiously twisted shells of *Planorbis carinatus* (of which a large proportion were sinistrally coiled),' from Leventhorpe Pastures, near Leeds. It has also been supposed that the reason of scalarity on Planorbidæ is atavism, as the ancestors have been conoid in shape. I am, however, of the opinion that there are several reasons. While some Planorbidæ did not differ in shape, t. exp. *Bathyomphalus contortus* (Müll.), *Segmentina nitida* (Müll.), *Hippeutis complanatus* (L.), *Spiralina vortex* (L.), we often find monstrosities between the *Gyraulus*, *Planorbis* and *Planorbarius*, and, of course, this explains that the breadth of the variability is larger between this group, and that they are still in evolution. Prof. Dr. B. Watzl, of Vienna, was kind enough to make some collections for me also this year (1927) in Tirol, in order to obtain alcohol specimens of *Gyraulus gredleri* Bielz and several scalariformed specimens were observed, all collected in small ditches.

DESCRIPTION OF FIGURES.

Fig. 1-2. *Cepæa hortensis* (Müll.) *perforata* Westl., Aalykkeskov, Odense, Funen, Denmark (leg. J. Hjort, July, 1926).

Fig. 3-4. *Succinea putris* (Linné) *scalaris* Schlesch, Ermelunden, nr. Copenhagen, Denmark, July 5th, 1927.

Fig. 5-6. *Gyraulus gredleri* Bielz, Type locality, Lengberg, Nikolsdorf, nr. Lienz, East Tirol (leg. B. Watzl., Aug. 25th, 1927).

Fig. 7-8. *Gyraulus gredleri* Bielz, Toblachersee, South Tirol (leg. B. Watzl., Aug. 26th, 1927). Normal form.

Fig. 9. *Gyraulus gredleri* Bielz monst. *scalariforme*, Toblachersee, South Tirol (leg. B. Watzl., Aug. 26th, 1927).

Fig. 10-11. *Gyraulus gredleri* Bielz monst. *scalariforme*, Lengberg, Nikolsdorf, nr. Lienz, East Tirol (leg. B. Watzl., Aug. 25th, 1927).

Fig. 12. *Gyraulus gredleri* Bielz monst. *scalariforme*, Arnbach, East Tirol (leg. B. Watzl., Aug. 27th, 1927).

Fig. 13-15. *Mytilus edulis* Linné deformed, Blaavandshuk, West Jutland, Denmark.

Fig. 16. *Planorbis planorbis major* Székésfehérván, Hungary (leg. Dr. B. Stred.). Specimen 26 mm. in diam., in the Schlesch Collection, Hull Museum.

Fig. 17. *Gyraulus gredleri* Bielz monst. *scalariforme*, East Tirol, Nikolsdorf, nr. Lienz, Aug., 1927 (leg. B. Watzl.), in the Schlesch Collection, Hull Museum.

Fig. 18-20. *Unio tumidus* Retz., Alokste, Latvia. (See leg. H. Peterson), in the Schlesch Collection, Hull Museum.

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Otters near Hull.—Two young otters were dug out in Old Sol, near Wawne, a section of the Sutton Drain, last week. I have this on the authority of Mr. E. W. Wade. Wawne is only half-an-hour's bicycle ride from Hull, and otters do not generally occur in Holderness.—Chas. F. Procter, February 16th, 1928.

Shap Granite Boulder at Kepwick.—During the recent excursion of the Yorkshire Geological Society to the Thirsk district, a boulder of Shap Granite containing a dark ' enclave ' was found in a quarry in glacial gravel at Incline Farm, Kepwick. This quarry is at the foot of Hambleton Hills and near the escarpment.—H. C. Versey.

Early York District Plant Records.—In a collection of plants made by the late Christopher Metcalfe in 1884, chiefly in the York district, presented to the Tolson Memorial Museum, Huddersfield, are specimens of the following :—*Meconopsis cambrica* Vig., from Sicklepit Wood, Nun Appleton ; *Anchusa sempervirens* Linn., from the same locality and *Campanula glomerata* Linn., from Bishopthorpe.—W. E. L. Wattam, Newsome.

Buprestis decora Fabr. at Huddersfield.—A few days ago, Mr. Manfield, gardener for Mr. E. J. Bruce, of 'The Gables,' Huddersfield, brought to me a small beetle alive, of a beautiful emerald hue, bordered with bronze. The South Kensington Museum authorities inform me that it is a North American wood-boring species ; hence has probably been introduced with timber. It was found in a conservatory, and had been under observation for some days. It manifested a preference for a plant of the Barbeton Daisy (*Gerbera*).—Charles Mosley, The Museum, Huddersfield, February 24th, 1928.

Schœnus nigricans L. in Wharfedale.—While in the neighbourhood for a few days at the close of the Grassington Meeting of the Y.N.U. last Whitsuntide, I came across a patch of *Schœnus nigricans* L. growing in a piece of boggy meadow near the river-side in the lower portion of Littondale. Judging from the records in the three published Yorkshire Floras, this sedge is not common in the county. Arnold Lees gives it as ' very rare,' and does not record it for the Wharfe area. Other species of interest obtained on the same occasion were *Blysmus compressus* Pers. (Littondale), *Carex dioica* L. (Hawkswick Moor), *C. pulicaris* L., *C. pilulifera* L., *C. fulva* Host., and *C. binervis* Sm. (Horse Head Moor, above Raisgill), and *C. acutiformis* Ehrh. (near Kilnsey and Conistone), while *Sedum villosum* L. occurred near Yockenthwaite in Upper Wharfedale.—JAMES M. BROWN, Sheffield.

Ornithological Notes from the Scarborough District.—On December 19th, 1927, a Siskin was observed by Mr. A. T. Wallis, who knows the bird well, to be feeding with sparrows in the main street of Scarborough. On December 28th, 1927, a Little Auk was picked up dead on the north sands at Scarborough. Another was swimming in the harbour on February 4th, 1928. On December 29th, 1927, a fine adult Fork-tailed Petrel was picked up in an exhausted and dying condition at Appleton-le-Moor, near Pickering, Yorks. About the middle of December, 1927, four Waxwings were seen feeding on the road near Peasholm Lake at Scarborough. About the same time two others were seen, and a dead one was picked up by the park keeper at the same place. In January, 1928, a Mute Swan was seen by Lord Derwent to pursue a sheep into the lake at Hackness, and seizing the animal's head, to hold it beneath the water until death took place. On August 9th, 1927, a Crossbill in dull green plumage was picked up dead at Stoupe Beck, near Whitby. Another, a male in red plumage, was found dead in Raincliffe Wood on September 23rd, 1927. On September 22nd, 1927, I saw ten Sandwich Terns flying high over the South Bay at Scarborough. On November 21st, 1927, a Black Redstart was seen at the Scarborough Mere by Mr. T. N. Roberts. An adult Velvet Scoter frequented the Scarborough harbour from November 24th to 29th, 1927. An immature Iceland gull also lived in the harbour at Scarborough from December 1st to the 10th, 1927. An adult Great Northern Diver made its appearance in the Scarborough harbour on January 21st, and has remained until the present date. It is very tame, and feeds chiefly upon the waste bait (whelks and squid) thrown overboard by the fishermen.—W. J. CLARKE.

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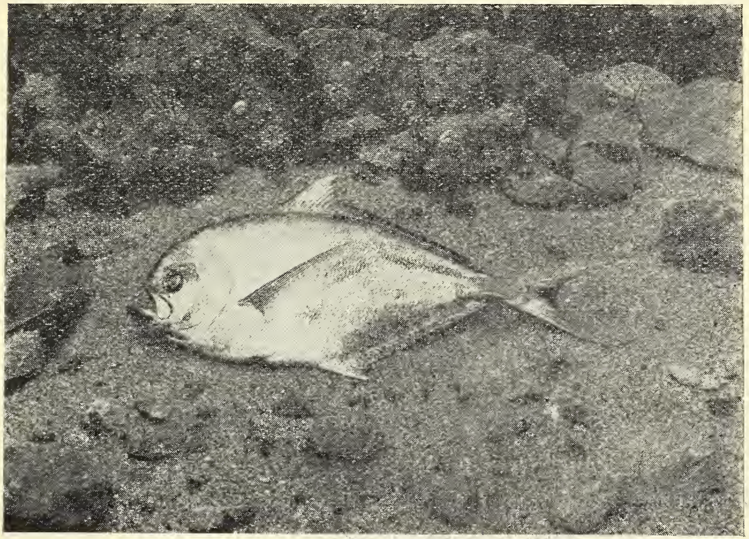
Mr. F. Buckley favours us with reprints of his papers on ' The Birmingham Glass Trade, 1740-1833,' and ' The Glasshouses of Dudley and Worcester,' reprinted from *The Transactions of the Society of Glass Technology*, Vol. II.

THE RECENT INVASION OF RAY'S BREAM (BRAMA RAII).

W. J. CLARKE.

DURING the last three months of 1927 a remarkable movement of Ray's Bream occurred along the eastern coasts of Great Britain, extending from the north-east of Scotland, down at least to as far south as Suffolk. A very large number of examples of this usually rare marine fish must have visited the North Sea, and many have been stranded at various points along the coast.



Photo] **Ray's Bream.** [*J. W. Clarke.*

The Yorkshire shores have received a good share of these visitors, and in the district within twenty miles north and south of Scarborough many have been found. The following list of fifteen occurrences at Scarborough, four at Filey, one at Flamborough, and four near Whitby is doubtless incomplete, but only records of which I am quite certain have been included.

The first of these fish to be noticed near Scarborough was a large specimen which was stranded at Scalby Ness on October 30th. Rats and gulls had greatly mutilated the fish, and it was not possible to ascertain the exact weight and measurements. On October 31st, one weighing 5 lb., and measuring 24 inches in extreme length, was stranded alive in in Scarborough South Bay. Others followed, as recorded below :—

Nov. 3rd.—One, about 5 lb. in weight, washed ashore dead in Scarborough South Bay.

Nov. 5th.—One, 5 lb. 11 oz. weight, and 24¼ inches long, stranded alive in Scarborough Harbour.

Nov. 7th.—One, 5 lb. 13 oz. weight and 24½ inches long, stranded alive in Scarborough Harbour. Another was taken on the same day on the sands.

Nov. 12th.—One, 5 lb. 11 oz. weight, and 23¼ inches long, stranded alive at Scarborough.

Nov. 16th.—One, dead and decomposed, washed ashore on the Scarborough South Sands. Another, 5½ lb. weight, and 23 inches long, stranded alive near the Bathing Pool, Scarborough.

Nov. 17th.—One, 5 lb. 8 oz. weight, and 23¾ inches long, stranded alive in Carnelian Bay, two miles south of Scarborough. This specimen is being preserved for the local Museum.

Nov. 24th.—One, washed ashore dead in Scarborough South Bay,

Nov. 28th.—One, 22½ inches long, washed ashore dead, but quite fresh, on Scarborough South Sands.

Dec. 2nd.—One, 5 lb. 4 oz. weight, and 23 inches long, stranded at Scarborough.

Dec. 4th.—One, 22½ inches long, washed ashore dead and decomposed in Scarborough South Bay.

Dec. 10th.—One, 19 inches long, washed ashore dead and decomposed at Scalby Ness, two miles north of Scarborough.

At Filey, specimens of the fish were taken as follows :—Two on Nov. 4th ; one on Nov. 9th ; and one weighing 5 lb. 7 oz. weight, and 24½ inches long, on Dec. 2nd.

In the Whitby district, one was taken at Upgang on Nov. 6th ; one at Whitby, on Nov. 16th ; another at Runswick during November ; and one 'about the usual size' at Whitby on Dec. 28th.

Finally, another example was brought up in the trawl near Flamborough Head, on Jan. 17th, 1928. It was dead and decomposed.

The migration appears to have been at its height during November and early December, and it is probable that many other examples occurred on lonely stretches of the coast, and were eaten by birds and beasts of prey, and consequently escaped observation. The beachcombers, too, found out that the fish were exceedingly good to eat, and many, no doubt, went straight from the shore to the frying-pan, and were not recorded.

Although Ray's Bream is not considered of extremely rare occurrence in the North Sea, I have no local record of one since Oct. 19th, 1895, when an example weighing 7½ lb. was taken at Scarborough, and was sent to the Museum at South Kensington.

Mr. F. Snowdon, of Whitby, however, sends me details of three occurrences at that place, and as they have not been previously recorded, I give brief details :—

NOV. 29th, 1921.—One, captured in shallow water on the sands.

OCT. 9th, 1922.—One, 23½ inches long, depth from tip of dorsal fin to tip of ventral fin, 12½ inches.

DEC. 2nd, 1922.—Another, 23 inches in length, depth from tip of dorsal to tip of ventral fin 12½ inches, length of pectoral fin 6 inches.

At Filey, on Nov. 17th, 1925, a specimen measuring 18 inches in length, and weighing 4 lb. 10 oz., was caught on a fisherman's hook baited with a Dahlia anemone, and was preserved for a local collector.

Ray's Bream is a fish of extremely wide distribution, found in all the waters from the Faroes in the north to the Cape in the south, and westwards to the shores of America. It is very common in the Mediterranean.

When the fish is alive, its colouring is very brilliant silver over almost the whole of its surface. This silvery covering rubs off very easily when the fish comes ashore, or is handled, and leaves it a colour which has aptly been described as like polished pewter. Over the silver, blue and rosy iridescences show according to the angle of light, but these also disappear very quickly after death.

None of the examples I examined had any food in the stomach, but one contained several parasitic worms.

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The Scientific Proceedings of the Royal Dublin Society, recently issued, include monographs on *Caninia cylindrica* Scouler and other *Caninias* from the Carboniferous Limestone of Ireland ; and 'Some Experiments on Feeding Rats with Soya Beans and other Materials,' by D. T. Barry and J. Freud.

The Memoirs and Proceedings of the Manchester Literary and Philosophical Society, 1926-7, among many others, contain the following monographs :—'Some Early Palæozoic Plants from Victoria, Australia,' by W. H. Lang ; 'Recent Advances in our Knowledge of Inheritance in Plants,' by F. E. Weiss ; 'Fish Remains from the Upper Ludlow Rocks of the Ludlow District,' by S. H. Straw ; and 'New Carboniferous Lamellibranchs and Notes on Other Forms,' by J. W. Jackson.

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REVIEWS AND BOOK NOTICES.

Fruits and Flowers: An Introduction to Botany, by **Constance Garlick.** London: C. W. Daniel & Co., 406 pp., 21/- net. In the ordinary text-book of Botany the definitions must be general, and to the beginner these are abstract and uninteresting unless accompanied by first hand observations of the specimens to be studied. In the present work the writer has endeavoured to overcome these inherent difficulties by selecting a number of plants which are hardy and will flower in a suburban garden, or can be bought at florists shops, and that of large flowers. Each species is illustrated by drawings of the characteristic parts of the plant, as well as dissections of the flower and fruit; these are drawn from nature by Miss Margaret Fuller. The descriptions are in simple language and are intended to be used along with the specimens, and a comparison of the parts made with the accompanying figures. After a brief account of the parts of a flowering plant, the species selected, numbering about a hundred, are dealt with in four sections, Autumn, Winter, Spring and Summer studies. There is a list of flowers suitable for a suburban garden which would form an interesting collection, especially if the plants were studied along the lines of this work.—T.W.W.

Possible Worlds and other Essays, by **J. B. S. Haldane.** London: Chatto & Windus, viii.+312 pp., 7/6 net. In this excellent little handbook Dr. Haldane has gathered together a large number of essays which have appeared in scientific publications, magazines, and the daily press, upon a variety of subjects. They have been largely written in railway trains, and the volume is precisely the kind for reading under similar conditions. The thirty-six chapters deal with such a variety of subjects as Scales; Dates; Man as a Sea Beast; Water Poisoning and Salt Poisoning; Cancer Research; What Use is Astronomy; William Bateson; Should Scientific Research be Rewarded?; Eugenics and Social Reform; When I am Dead; Some Enemies of Science; and The Last Judgment. With regard to one of his chapters he says:—'When I am dead I propose to be dissected; in fact, a distinguished anatomist has already been promised my head should he survive me. I hope that I have been of some use to my fellow creatures while alive, and see no reason why I should not continue to be so when dead. I admit, however, that if funerals gave as much pleasure to the living in England as they do in Scotland I might change my mind on the subject.'

Systema Aranearum, by **Alexander Petrunkevitch, M.A., Ph.D., D.Sc.**, Professor of Zoology in Yale University. *Trans. of the Connecticut Acad. of Arts and Sciences*, Vol. 29, January, 1928, pp. 1-270. As knowledge of the spiders of the world increases, revision of existing classifications becomes imperative. The purpose of the present work is ambitious, namely, to attempt to group spiders in a natural system, and to provide keys to sub-families and a list of genera. Since the publication of Simon's monumental work a quarter of a century ago, the number of known species has been almost doubled, and knowledge of structural features has increased vastly. It has, therefore, become more and more difficult to survey the field without an up-to-date list and some workable natural system. This Prof. Petrunkevitch attempts to supply. His keys to families and sub-families are valuable, as is also his list of genera, which gives in each case reference to the publication in which the generic type is first described. For example, the genus *Eboria* Falconer, 1910, is referred to in *The Naturalist* for that year, and the typical species is given as *E. caliginosa.* To this section there is an alphabetic index. The volume also includes an alphabetic list of Synonyms of Recent Genera and an Index to Families. It will be seen that there is here a useful work of reference for the student of the spiders.—T.St.

ZOOLOGY TEACHING IN SCHOOLS.

A MEETING of British professional zoologists, representing the principal universities, colleges, and museums in Great Britain, met in the Zoological Society's Rooms, Regent Park, London, on Saturday, January 7th.

The morning session was almost entirely devoted to discussing a report 'To consider the position of animal biology in the school curriculum' and matters relating thereto. Among the speakers were Professor Douglas Laurie, Professor MacBride, Professor Hickson, and representatives from colleges, secondary schools (both boys and girls), and the Board of Education.

It was pointed out that while botany was well represented in some boys' and many girls' educational establishments, zoology was usually almost neglected. This was alleged to be due to the lack of encouragement given to the teaching of zoology by H.M. Inspectors of Schools, and certainly some of the Professors of Zoology stated that the lack of available posts for zoologists discouraged them in their work, on account of the difficulty in finding posts for the students on the completion of their studies.

It was realised that at present most school time-tables are already overcrowded, but it was felt that the time already devoted to physics, chemistry, and botany (or in some cases natural science) might, with a little readjustment, so be arranged as to include zoology or 'animal biology.'

An official from the Board of Education stated that the present time was most opportune to send a deputation from the meeting to the Board to represent the meeting's views on this most important matter, as at the moment the Board was considering the question of teaching elementary biology in the boys' secondary schools. Perhaps it should here be stated that this official—an inspector of staffs under the Board—wished to see the words 'nature study' absolutely abolished and 'elementary biology' substituted. He considered 'nature study' to be meaningless, nebulous, and idiotic.

Representatives of two important girls' colleges stated that while botany was a great favourite, their experience was that zoology equally appealed to and interested the student, and that if encouragement were given to them by the Board of Education they would be pleased to substitute biology (which included both animal and plant life) for botany.

Other speakers stated that while in general schools the students knew about certain flowering plants (and drew circles with arcs therein, which they called diagrams!) they knew nothing of the fungi or algæ. Another examiner who put the question 'What animal life would you expect to find in a well-cultivated garden?' was told by one boy

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'worms' (which so far was quite correct), but he went on to say, 'also hares, rabbits, moles, and occasionally a badger.'

After considerable discussion the following recommendations were made :—

(1) That biology should be included as a fundamental subject in the curriculum of all schools, whether for boys or for girls, so that every boy and girl should study plant, animal and human biology during several years of school life.

(2) Those responsible for advising students in the universities are invited to note the shortage of women teachers of biology having training in zoology, and of men teachers having training in either zoology or botany.

(3) Those school certificate examination bodies which do not at present provide syllabuses in biology, namely, the University of Bristol, the Oxford and Cambridge Schools Examination Board, and the Oxford Local Examinations, are invited to consider providing them.

(4) The various school examination bodies are invited to consider the provision of syllabuses including biology, chemistry, and physics as a combined subject at both school certificate and higher certificate levels.

(5) The universities are invited to review the needs of their science students who intend to become teachers, and who form so large a proportion of the students in the modern universities, with a view to providing schemes of study related more definitely to their needs. The present honours degree schemes are, it is thought, well designed to meet the requirements of specialists, but it is submitted that there is need for a more general type of honours scheme as an alternative to the present specialist one.

The members had luncheon together in the society's garden, and then continued the conference until a late hour. Among the other papers read and discussed were 'The Scale of Pay of Zoologists,' by Professor Stanley Gardiner and Dr. Guy Marshall ; 'The Great Barrier Reef Expedition of 1928,' by Sir Sidney Harmer and Dr. C. M. Younger, and 'Binominal Nomenclature,' by Dr. E. J. Allen and Dr. W. T. Calman.

The members also had an opportunity of seeing the wonderful new reptile house in the gardens, which is almost as fascinating as the new aquarium.—T.S.

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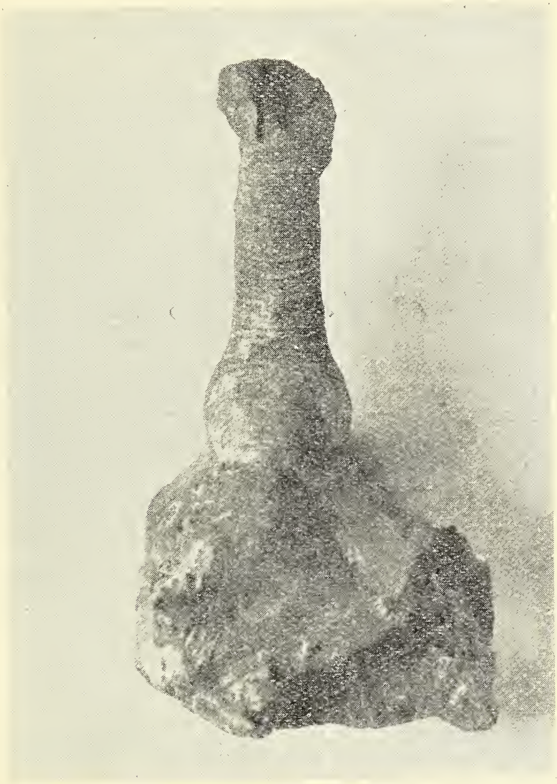
In *The Entomologist's Monthly Magazine* for March, Prof. F. Balfour-Browne states :—' In Part IV. of "The Natural History of Wicken Fen," just published, there is a paper on "The Coleoptera of Wicken Fen," in which is given a description and three sketches of what is described as the "Balfour-Browne net." Scarcely anything stated is correct.'

PRODUCTUS (NOW *PROBOSCIDELLA*) *PROBOSCIDEUS* (DE VERNEUIL).

MARY A. JOHNSTONE, B.Sc., F.L.S.

THE specimen figured herewith was collected on the occasion of the visit of the Yorkshire Naturalists' Union to Malham in August, 1925. It was the reward of half-a-day's extra labour put in after the main party of scientists had gone home.



Proboscidella proboscideus.

This *Productus proboscideus* was found in an outcrop of Upper Viséan knoll limestone at Black Hole, about half a mile south of Malham. Three bands of highly fossiliferous limestone, important for their Goniatite contents, are exposed there; the specimen occurred in the middle band, in company with *Goniatites crenistria*, etc.

Apparently the only other English record is of a specimen found by Burrow in Carboniferous limestone in the neighbourhood of Settle (no more exact locality is stated), described in a monograph of the Palæontographical Society, by T. Davidson, Vol. II., and figured on Plate 33.

It is also recorded and figured from Loughshinny, Co. Dublin, by Matley and Vaughan, in the *Quarterly Journal of the Geological Society*, 1908. It is figured by de Verneuil in the *Bulletin de la Société Géologique de France*, Vol. XI., 1840, and also figured by de Koninck.

Davidson said of *Productus proboscideus* : 'This Productus is one of the most remarkable of the genus, and its discovery by Mr. Burrow in the Carboniferous limestone of Settle, in Yorkshire, was the more interesting from the fact that authentic examples of the species had not until then been found in any other locality than Visé, in Belgium.' The dorsal valve is normal in shape and small ; the ventral valve is extraordinary. Part of it corresponds with, and fits into the dorsal valve ; the lateral margins of this portion are prolonged in a direction opposite to the beak, and united into a long cylindrical tube—the 'proboscis.' The Belgian writers record a good deal of variability in the length and width of the tube, and state that it may be twisted or may bifurcate. De Koninck concludes that the extremity was open ; it has never been found complete. D'Orbigny believed that the peculiar form was an accidental malformation ; according to other opinions it is normal.

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A Second Yorkshire Locality for Hormotila mucigena.—In a sample of scrapings taken from the surface of exposed rocks in a disused limestone quarry at Kiveton Park (near Sheffield), and handed to me by a friend, I was fortunate in noticing some good growths of the little-known Alga, *Hormotila mucigena* Borzi. This appears to be the second recorded locality for this species in England, the late G. S. West having obtained it from Boston Spa (W. Yorks.). The only other British record is from Scotland (see West's 'British Freshwater Algæ,' 2nd ed., p. 86). The alga is rather anomalous in structure, consisting of green cells, more or less spherical, lying at irregular intervals within branched, cylindrical and stratified mucilaginous tubes. Very little seems to be known regarding its life-history. Its small size and its close association with other algæ make it easy to overlook. I have to thank Professor F. E. Fritsch for confirming my identification of the plant, and for checking the abovementioned localities.—James M. Brown, Sheffield, 13th February, 1928.

MARINE ZOOLOGY AT SCARBOROUGH.

J. A. STEVENSON.

While at the habour on Tuesday, November 15th, a boy gave me a very small Lumpsucker, or 'Stone-clagger,' as this fish is called here. It was coloured vivid blue-green all over. At the beginning of last year I was also given one of these fish, only slightly larger than this one. This fish generally inhabits the sea bottom close to the shore, but this specimen had been caught in a herring-net, perhaps fifteen miles out, and at the surface. It was only 5½ inches long.

While searching about among the litter on the Scarborough trawler *Tyndrum*, on November 28th, 1927, I found no fewer than fifteen specimens of a hermit crab new to me. None of them was more than ½ inch of length in the body. On reaching home I discovered them to be Smooth-clawed Hermits (*Eupagurus lævis*), another addition to the local list. They were trawled just south of Whitby.

On 30th November, 1927, I found in a sandy pool a large, living male of the Spiny Galathea (*G. strigosa*). It is not often found on the shore, being commoner half a mile out.

During December last a large number of Cuttlefish (probably *Sepia officinalis*) 'bones' were found on the shore. Ranging from two to ten inches in length, they sometimes occurred in quantities. Curiously enough, it is a long time since a whole specimen of this creature has been seen here—I have *never* seen one. The 'bones' were probably cast up by the heavy seas during the month.

On December 9th I found a very small specimen of the Circular Crab in the Carnelian Bay rock-pools ; normally this is a deep-water species.

On the next day a very large Northern Stone Crab was found in North Bay, alive. It is very rarely that this crab strays from deep water.

Lately I have been finding shrimps quite commonly on the decks of trawlers fishing anything up to fifty miles out : shrimps generally keep close to low-tide mark.

The new year started off with an influx of Lesser Spotted Dogfish (*Scyllium canicula*) : on January 4th my brother and I counted fifty-four on the fish market, all about 2½ feet long, and all alive. On the next day the trawler *Diana* caught ten more off Scarborough. On the day after, January 6th, we were told that the crew of the trawler *Victoria* had caught sixty-five specimens, but they had thrown them away as useless, as also had the crew of the *Tyndrum* on the day following to another specimen. On January 9th the *Evergreen* caught a dozen more, while on 13th January, two more had been caught by two different trawlers. The last of the series was one caught by the *Star of the Empire* on 17th January. Since then none had been seen. This small shark is not common, and has, omitting this influx, been but sparingly recorded here in the past.

On January 6th my brother procured a 6-inch specimen of the Lesser Fork-beard or Tadpole Fish (*Raniceps raninus*) from the *Victoria*, which had been fishing in deep water off Whitby. This fish is not common, and this particular specimen is apparently the first record for the species having been caught here, all others having been washed up on the shore.

Several times I have found a small stalked barnacle attached to weeds on trawlers' decks, and on sending one to the British Museum, I discovered them to be *Scalpellum vulgare*, new to the local list, but certainly not rare.

On January 16th the trawler *Strathdee* landed nearly a ton of Queen Scallops (*Pecten opercularis*) on the quay. During the war this mollusc became quite scarce, and is only now getting its own back again, as there have been several boxes of them landed lately.

The following is a list of specimens the 'second-hand' of the trawler *Tyndrum* had for me on January 21st: five Norwegian Topknots (*Scophthalmus norvegicus*); three 4-horned Sea Bullheads; one Sucker Fish (*Liparis vulgaris*); one Sucker Fish (*Liparis montagui*); three Long-armed Munidas (two of which bore light-brown spawn); one large Cleanser Swimming Crab; a Pogge, and several more common forms.

The second-hand of the *Tyndrum* is the only fisherman I have ever come across who has been able to discriminate between the Cleanser and Marbled Swimming Crabs! He takes a great interest in marine life.

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C. W. Greatorex writes 'concerning asses' in *The Animal World* for February.

Some of R. W. Welch's beautiful photographs are reproduced and described in *Irish Travel* for February.

The Journal of the Imperial Fisheries Institute, issued at Tokyo in October, contains five memoirs in English.

In *The Irish Naturalists' Journal* for January, Matilda C. Knowles writes 'on The Irish *Spiranthes romanzoffiana,*' with a coloured plate, and there are valuable phenological reports, etc.

Mr. S. Billinghurst favours us with a reprint of his paper from *The Geological Magazine* for November, on 'Some New Ammonoidea from the Chalk Rock.' It has some excellent illustrations.

A particularly interesting article on 'The City and Port of Manchester,' by W. H. Barker and W. Fitzgerald, appears in *The Journal of the Manchester Geographical Society*, Vols. XLI.-XLII. for November.

R. Dootson writes on 'The Human Body' in *The Medical Herbalist* for February. He enumerates 67 bones in the cranium, 62 upper extremities and limb bones, 64 leg bones, etc., making a total of 257 in all.

CORNBRASH AT KEPWICK, N.E. YORKSHIRE.

H. C. VERSEY.

From the point of its appearance at sea-level in Cayton Bay, the Cornbrash forms a well-defined and easily recognisable horizon, and may be examined at several points at the foot of the escarpment of the Tabular Hills. In the valley of the Rye, above Helmsley, it ceases to be represented in the sequence, although, near Shaken Bridge, it has been tried in the past as an ironstone. According to the Geological Survey, this point is the last place where definite Cornbrash may be recognised until Appleby, in Lincolnshire, is reached —a hiatus of 46 miles. The sudden thinning out of the Cornbrash in the Hambleton Hills has been attributed by Prof. Kendall to the contemporary operation of the Kilburn and Gilling Faults.

From what I saw on a recent excursion of the Yorkshire Geological Society to Thirsk, it would seem that the outcrop of this rock is not so restricted as previously supposed. The escarpment of the Hambleton Hills above the village of Kepwick is masked to some extent by landslips, so that the line of division between the various divisions of the Lower and Middle Oolites cannot be well seen. Two lines of springs, however, mark the base of the Lower Calcareous Grit and Kelloways Rock respectively. The use of these springs by a local waterworks authority has resulted in the beds at the two junctions being exposed. At the upper one, Oxford Clay and Corallian fragments were visible among the debris. In the lower tips, the fragments of Kelloways Rock, with characteristic fossils and of definite local facies, were seen. They were accompanied by numerous pieces of a greyish limestone, partly oolitic, and full of shell fragments, chiefly lamellibranchs. The absence of any of these at the upper junctions rules out a Corallian age for these fragments. I am unaware of any such rock among the Kelloways Rock of Yorkshire, and would suggest that they belong to a thin representative of the Cornbrash. The following is a short petrographical description of the fragments: Two chief varieties may be noted, oolitic and shelly. The first consists of oolitic grains of limonite, which look black in the hand specimen, but consist of finely granular concentric layers of limonite, with occasional alternations of limonite and dusty calcite. Spherical objects of small dimensions resembling the ‘ spheres ’ in the Chalk are very common, and part of the rock seems made exclusively of them. They differ from ‘ spheres ’ in being larger, and having in the majority of examples a centre of chalcedonic silica. They may, therefore, be sponge spicules, and strongly resemble spicules of Rhaxella found occasionally in the Lower Calcareous Grit. These spherical objects frequently act as nuclei to the oolitic grains. Less abundant are detrital fragments of a phosphatic appearance, and shell fragments are replaced by the same substance. The ground mass of the rock consists of a fine granular calcite. The shelly variety is full of broken shell fragments, all, apparently, of lamellibranchs, the individual shelly layers being well seen. Occasionally oolitic growth has started round the fragments, giving grains of somewhat angular type. Rarely is a complete shell section visible. Foraminifera are fairly common, with Textularia the chief form. Occasional spicules occur, and the ground mass is similar to the other variety.

The general petrographical character is quite in keeping with the view expressed above, viz., that the rock is the thin end of a dying-out stratum. The thinning would probably be due to contemporaneous erosion. Whether this thinning was due to the action of the Coxwold Faults or to some other action cannot be definitely said.

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An Illustrated Handbook of the British Sphagna, by **W. R. Sherrin.** London: Taylor & Francis, x.+74 pp., 6/- net. For a long time the study of British Sphagna has been neglected on account of the difficulty in getting specimens identified. To a large extent this difficulty has been overcome by the issue of the present handbook, which, besides containing details of all the British known species, has several plates illustrating the characteristic features of the various forms dealt with. A quarter of a century ago Horrell issued a publication on European Sphagnaceæ, after Warnstorf, but that work has long been out of print, and in view of more recent researches is to some extent out of date. Mr. Sherrin has made up these deficiencies, and we can recommend the present handbook.

Text-book of General Zoology, by **Winterton C. Curtis** and **Mary J. Guthrie.** London: Chapman & Hall, xv.+585 pp., 18/6 net. The Professor of Zoology and the Associate Professor of Zoology at the University of Missouri have published this admirable volume with that wealth of illustration which we expect from American text-books of this character. While, naturally, these are largely drawn from American examples, the treatise is written in such a way that it will appeal particularly to the student for whom it is specially written. The various chapters are headed Natural History of Vertebrate Animals; Morphology of the Vertebrate Body; Physiology of the Vertebrate Animal; Metabolism and Irritability; Cells of the Vertebrate Body; Representative Single-celled Animals; General Problems Related to Single-celled Animals; Reproduction; Classification and General Organisation of Animals; Hydra, A Simple Many-celled Animal; Earthworm and other Annulata; Animal Nervous System; Crayfish and the Arthropoda; Locust; Some Representative Insects; Development of the Frog and Other Vertebrata; Some General Problems of Development; Genetics; Theory of Evolution; and Causes of Evolution; and for each of these there are several sub-headings which admirably assist the student in selecting any particular part of this vast subject likely to interest him. The historical chapter has portraits of Darwin, Wallace, Huxley and Agassiz.

BRITISH DEEP-SEA FISHES.

A. FRASER-BRUNNER.

In a recent issue of *The Naturalist* I was able to describe a deep-sea eel, under the name of *Nemichthys infans*, from Cardigan Bay. Since then, owing to the courtesy of Mr. J. R. Norman, of the British Museum, I have been privileged to examine several species of Nemichthyidæ, and am satisfied that the fish described by me belongs to a distinct genus, *Avocettina*, Jordan and Hubbs, characterized by the absence of a caudal filament and the possession of only one row of pores along the lateral line instead of the three rows in *Nemichthys*.

The record, which is the first for the British fauna, aroused considerable interest, and the fish unfortunately sustained a certain amount of damage in subsequent transport for exhibition purposes ; it still remains a good specimen, however.

Except for the little fish known as the 'Sleppy Argentine,' *Maurolicus borealis*, this is the only bathybial fish which can undoubtedly be called a British species, but a number of others have been taken much nearer to Great Britain than to any other country, and have not been included in our fauna because they have been obtained outside its limit—the 100 fathom line.

In these cases I consider that exception should be made in order that the records should take their proper place in the fauna of the world.

Deep-sea fishes which have previously been referred tentatively to Britain are *Aphanopus carbo*, *Alepocephalus giardii*, *Argyropelecus hemigymnus*, *Paralepis coregonoides*, *Myctophum glaciale*, *Notacanthus sp.*, and *Coryphœnoides rupestris*.

In my own collection I have the following fishes from 230 fathoms* or from the surface, twenty miles south-west of the Lizard :

FAMILY ASTRONESTHIDÆ.

1. A small specimen (1½ inches long) of *Astronesthes niger*, a naked, black fish, with enormous mouth, long canines and hyoid barbel, from dredge ; and two larvæ of the same species, from tow-net.
2. Several specimens of *Yarrella blackfordi*, 1½ to 2 inches, long and black, with a double row of luminous organs along the side ; from dredge.

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* This depth is very doubtful, being measured by the tow-rope of the dredge. It may only have been 70 fathoms.

FAMILY STERNOPTYCHIDÆ.

3. One specimen of *Argyropelecus olfersii*, one inch long, deep bodied and silvery, with oblique mouth and large photophores on body, and a transparent horny plate in front of the dorsal fin; from dredge.
4. Many small specimens (up to half an inch) of *Polypinus spinosus*, similar in general appearance to *Argyropelecus*, but lacking the horny dorsal plate, and possessing instead two short spines. This species evidently lives in shoals. From dredge.

FAMILY MAUROLICIDÆ.

5. Several specimens of the 'Argentine,' *Maurolicus borealis*, a bathypelagic fish of frequent occurrence on the south coast (I have also a specimen taken at Weymouth in 1926); from tow-net.

FAMILY MYCTOPHIIDÆ.

6. One badly damaged specimen of *Myctophum glaciale*, a 'lantern fish' with luminous spots on the sides and with large eyes; from dredge.
7. A young example of *Myctophum humboldti*, similar, but with a larger mouth; from tow-net.

FAMILY MELAMPHÆIDÆ.

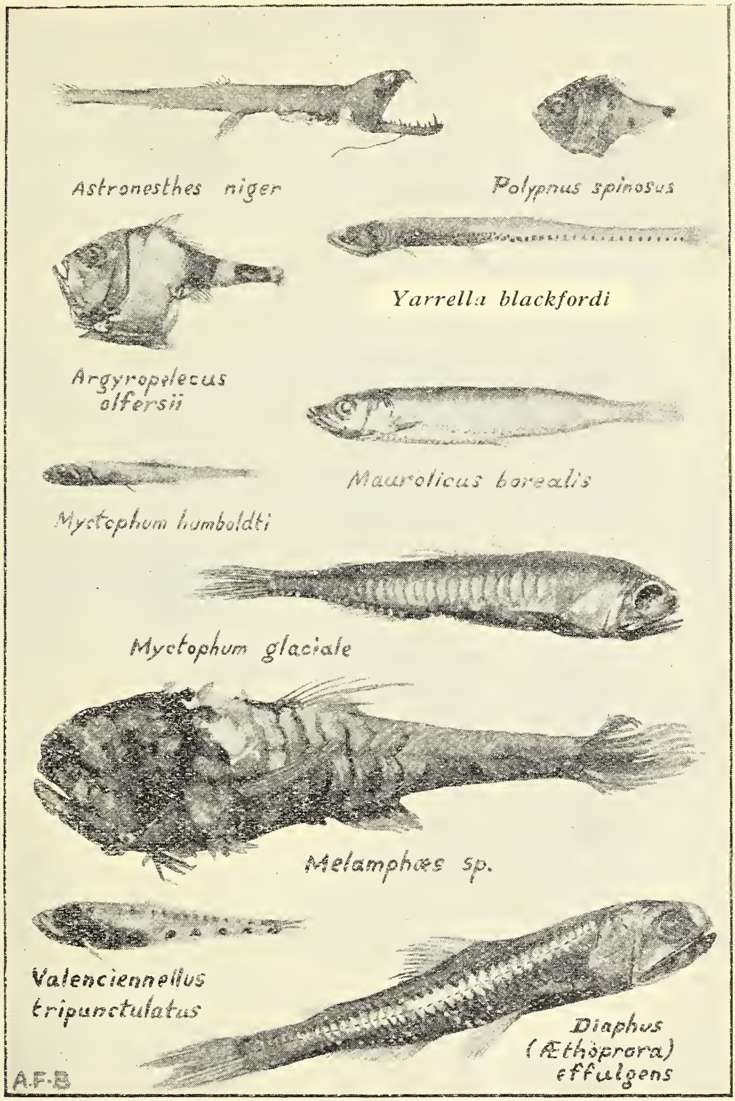
8. A badly damaged example of *Melamphoes sp.*, probably *megalops*; from dredge.

To these may be added two species obtained farther south (in the vicinity of 18° W. Long., 38° N. Lat.) from about 300 fathoms.

The first is *Diaphus* (*Œthoprora*) *effulgens* (family Myctophiidæ), which differs from *Myctophum* in the division of the photophores to resemble the Greek letter θ (theta) and the possession of a large luminous gland, the light of which is produced by bacteria, in front of the eye; I have about twenty specimens of this.

The second is of exceptional interest. It is *Valenciennellus tripunctulatus*, a tiny fish with twenty-three luminous patches on the head, a row of sixteen along the belly, and about twenty-five arranged in groups along the side. This species was first described by Esmark, who named it as above. Another, very badly damaged, was described by Brauer, who called it *V. stellatus*, with *tripunctulatus*, placed doubtfully in the synonymy. Since then, except for an example from the Timor Sea described by Weber, none appears to have been taken until those now under consideration. These are five in number, two large perfect examples ($1\frac{1}{4}$ inches), one of which is now in the British Museum, an equally large specimen with damaged head, and two smaller ones in perfect condition.

Most of the species mentioned are bathypelagic, capable of living in almost any depth, many coming to the surface at night, and there is little reason why they should not be taken within the 100 fathom limit were they to be expressly sought after at the right time and with the proper apparatus.



1928 April 1

THE YORKSHIRE NATURALISTS' UNION'S ANNUAL REPORT

FOR 1927.

(*Continued from page 85*).

Reptiles and Amphibians :—Mr. Clarke forwards the following notes :—

Vipers have been much more in evidence on the moors between Scarborough and Whitby during the past summer, and in certain remote districts appear to hold their own well, in spite of ceaseless persecution.

Frogs were observed moving about on November 19th, 23rd, 26th, and December 12th and 25th, 1926, and on January 3rd, 1927, unusual dates for the appearance of this bachachian, which should then have been deep in its winter hibernation.

WILD BIRDS AND EGGS PROTECTION COMMITTEE.

Yorkshire Wild Birds and Eggs Protection Committee (F. H. Edmondson) :—The Breeding Season for 1927 has been an exceedingly wet one. Migrants arrived about the usual time, and generally in increased numbers. The Corn Crake, or Land Rail, has again been practically absent. Owing to the wet and cold summer, there have been fewer birds of all descriptions reared than in normal years.

The Peregrine Falcon in North-west Yorkshire.—The pair we specially protect tried to rear its young, but the eggs were taken, although they were well marked with indelible ink. One pair in Yorkshire reared their young, and another pair on the borders of Yorkshire and Lancashire were also successful.

Stone Curlew in the North Riding.—Six pairs arrived at their breeding station, three sets of eggs were seen, and four young were known to fly.

Hornsea Mere.—The normal breeding birds have been here this season, and in the majority of cases have successfully reared their young. We secured the services of the same watcher as last year for evenings, Saturdays and Sundays, and this seems to have worked very well.

Fulmar Petrel.—These birds have again bred sparingly all along the cliffs, practically all the way from Flamborough to Saltburn. Two pairs were feeding young at Bempton on August 7th, but were in such a position that we could not see the young.

Kilnsea and Spurn.—The Lesser Terns arrived about April 27th. On May 15th, twenty sets of eggs of Ring Plover were marked. On May 27th the first Terns' eggs were marked. On June 15th several nests were destroyed by high water. High wind and drifting sand caused a good deal of damage at both Kilnsea and Spurn on June 18th and July 9th. The last eggs were marked on July 14th. On the whole, I think we have had a moderately good season at Spurn.

At Kilnsea our watcher reported that Mr. A. T. Breasley had been taking the eggs of the Lesser Tern. Mr. Wade got into touch with the Superintendent of Police at Withernsea, and also attended Court on our behalf. A conviction was secured, and the defendant was fined 30s. The report of the proceedings was in all the local newspapers. It is to be hoped that it will have the desired effect.

Merlin in the West Riding.—A few pairs scattered over the County have been successful in rearing their young ; many nests have been destroyed by gamekeepers.

Indelible Ink.—We shall have to find some substitute for the ordinary indelible or copying ink, as it seems possible to erase the ink, or make it not obvious on heavily-marked eggs.

BALANCE SHEET.

RECEIPTS.	£	s.	d.
Mr. A. Hirst	5	0	0
Mr. W. H. St. Quintin	5	0	0
Mrs. Bishop (1927-8)...	2	2	0
Major Dent	2	0	0
Mr. J. Atkinson ...	1	1	0
Mr. H. B. Booth ...	1	1	0
Mr. S. H. Smith ...	1	1	0
Mr. B. Lipscomb ...	1	1	0
Miss Waterhouse ...	1	1	0
Mr. J. Wilkinson ...	1	1	0
Mr. F. H. Edmondson	1	0	0
Mr. R. H. Edmondson	1	0	0
Mr. W. G. Bramley ...	0	15	0
Mr. H. J. Behrens ...	0	10	6
Mr. E. B. Gibson ...	0	10	6
Mr. J. F. Musham ...	0	10	6
Mr. C. H. Proctor ...	0	10	6
Mr. E. W. Wade ...	0	10	6
Mrs. J. S. Binns ...	0	10	0
Mr. E. Cockshaw ...	0	10	0
Mr. R. Chislett ...	0	10	0
Miss Edmondson ...	0	10	0
Mr. W. J. Forrest ...	0	10	0
Mr. J. Y. Granger ...	0	10	0
Mr. A. Haigh-Lumby...	0	10	0
Mr. A. Jordan ...	0	10	0

	£	s.	d.
Mr. E. W. Taylor ...	0	10	0
Mrs. Yellowlees ...	0	10	0
Mr. G. Fysher ...	0	5	0
Mrs. J. Wood	0	2	6
Mr. W. Waterhouse ...	0	2	6
Masters F. and P. Wood	0	1	0
Total Subscriptions ...	31	6	6
Bank Interest from June 1926, to June, 1927	0	9	6
Balance from Season 1926	19	0	2
	£50	16	2

PAYMENTS.	£	s.	d.
Mr. J. W. Medcalfe ...	14	0	0
Mr. J. B. Clubley ...	6	0	0
Mr. M. Hodgson ...	4	0	0
Mr. J. Green	3	0	0
Mr. N. Pateman ...	0	10	0
Commission	0	0	9
Total Cost	27	10	9
Balance in Hand ...	23	5	5
	£50	16	2

Audited and found correct, 15th October, 1927

W. E. L. WATTAM.

FREDA EDMONDSON,
Hon. Treasurer.

ENTOMOLOGICAL SECTION.

W. D. Hincks :—In a report of this section's activities we must first refer to the great loss Yorkshire entomology has sustained by the death of the President of the Section.

G. T. Porritt, F.L.S., F.E.S., was one of the chief movers when this section was organised, and for more than 50 years his hand has guided and shaped the course of its development. It is difficult to realize all that he did in this by his kindly interest and his readiness to help beginners. Such encouragement and assistance has been the means of developing many of our present leaders.

A section so long under one guiding hand will feel the loss severely, and can only hope to carry on by adhering to the methods of the lost leader so well expressed in his own words : 'In our field meetings everyone meets on an equal footing, and in the mutual intercourse between class and class it is inevitable that each will find out the good qualities of the other.'

It is fortunate for Yorkshire entomology that his valuable collections are available for students at the Huddersfield Tolson Memorial Museum.

At the annual meeting of the section the choice of a successor was not so difficult as it at first appeared, for in Mr. J. Meikle Brown, B.Sc., F.L.S., we have one whose wide interests and achievements in entomology indicate his capability of carrying on the traditions of the section.

Lepidoptera Committee (B. Morley) :—Systematic collecting has been almost out of the question during the past wet season. When

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collecting was attempted, lepidoptera did not appear up to normal numbers except for a week or two about mid-summer.

It was well into June before the three species of common white butterflies were flying in any numbers, and the second broods were also late, indeed, *P. brassicæ* did not put in a second appearance until the end of September. At Skelmanthorpe a few broods of the larvæ of *Vanessa urticæ* were observed feeding on nettle in July, and at Huddersfield *V. atalanta* was seen flying a few times during September. At Wentbridge on Whit Monday I saw a fine example of the latter gliding gaily from flower to flower on the roadside. This occurrence is of interest in view of the controversy respecting the ability of the species to survive hybernation in this country. If the specimen had been a worn one, immigration would have been sufficient to accountf or its appearance, but its condition was so perfect that it would seem very probable that it had not travelled far since awakening from its winter's sleep.

A few species of moths were obtained at Whitsuntide which are noteworthy. Mr. R. J. Flintoff, of Goathland, sent to me alive an example of *Abraxas sylvata*, a species not previously recorded from that district. Mr. G. Bennett took *Lobophora viretata* in Bastow Woods, a scarce species in the county, and Mr. C. A. Cheetham sent me specimens of *Pyrausta purpuralis* and *P. cingulata* from Austwick, the latter being very local ; this record gives only the fourth locality from which the species has been reported in the county.

On the occasion of the Union's visit to Grassington, Mr. Rosse Butterfield, in company with Mr. Wood, noticed a big patch of *Saxifraga hypnoides* on the slopes of Dibb Scar. Thinking the place likely for *Larentia ruficinctata*, they visited the place again on July 2nd and found several freshly emerged imagos. Subsequently visiting the place again they found the species relatively common resting on the limestone rocks near the food plant. They also found *L. salicata* and an example of *Demas coryli* in Grass Wood.

Seven examples of *Acherontia atropos* are reported, one from Edgerton, Huddersfield, on July 31st, one from Shelley, and two from the Keighley district in September ; Mr. C. A. Cheetham reports one from Dewsbury taken in June ; Mr. J. Lyle one from Shibden, September 3rd, and Mr. R. J. Flintoff another from Goathland, September 14th.

Sphinx convolvuli seems to have been common in the West Riding also. A fine one was brought me from Waterloo, Huddersfield, on the 10th, and another from Honley on the 16th August. One is reported from Todmorden, and Mr. E. G. Bayford reports one from Cawthorn and others from Denby Dale as occurring during September. Mr. J. T. Wigin has one taken at Methley, August 11th ; Mr. J. Hooper one from Middlestown, September 4th, and another from Castleford, August 9th, and Mr. T. A. Lofthouse reports one for Middlesbrough taken in September

Mr. W. E. L. Wattam received a fine *Chærocampa elpenor* taken in Leeds Road, Huddersfield, on June 27th. Mr. J. T. Wigin found several larvæ at Methley, and the species is also reported from Allerthorpe and Doncaster. *C. porcellus* is reported from Bawtry.

There is evidence now that *Plusia moneta* is an established species in the county, and is likely to be found on monkshood in gardens. In August Mr. E. P. Butterfield had the species again from Wilsden, another was added to the Huddersfield records from Dr. T. W. Woodhead's garden ; the species occurred again very commonly in Mr. H. Spencer's garden at Elland, and in the allotments at Skelmanthorpe it was also common. For the first time Mr. R. Butterfield found it in his garden at Riddlesden, where several pupæ were obtained all from the leaves of monkshood, except one which had spun up on a leaf of dandilion. He found none on delphinium, although several plants grow in the garden. Mr. T. A. Lofthouse reports one from Middlesbrough in August, and Mr. J. T. Wigin found larvæ at Methley in spring.

Xanthis aurago is also extending its range. For many years it has been abundant in Deffer Wood, near Cawthorn, and in the surrounding woods a number of specimens have been found. The late Mr. G. T. Porritt sought for it many times in the Huddersfield district, but without success. It is now, however, approaching the town, as Mr. H. Dyson found one in Storth's Hall grounds on September 12th.

The outstanding record for the year is the capture of a perfect male, *Boletobia fuliginaria*, by Mr. W. Buckley, in an outhouse at Skelmanthorpe. This fungi-feeding species has never before been recorded in this country further north than Worcestershire, and the total records for Britain are fewer than thirty.

Mr. Lofthouse has taken again *Tortrix cinnamomeana* from larch in Kildale, a species which still remains scarce in the county.

Coleoptera Committee (M. L. Thompson, F.E.S.) :—Members of the Coleoptera Committee attended the meetings of the Union at Hayburn Wyke, Grassington, Buttercrambe Woods, Allerthorpe Common, and Sedbergh, when a few of the more interesting beetles characteristic of these localities were met with. A few species have been added to the Yorkshire list. *Oxypoda umbriata* Grev. was taken in Arncliffe Wood, Glaisdale. *Atheta currax* Kraatz., *A. tomlini* Joy, *A. monticola* Th., and *A. aquatilis* Thoms were found in the Scarborough district. *Cantharis darwinianus* Shp., found on the coast at Eston-in-Cleveland some years ago, and only recently satisfactorily determined, is also of considerable interest. The very unfavourable weather prevailing during the greater part of the past season rendered these insects particularly scarce, and no further information on the occurrence of rare species has reached me. It is hoped to publish a more detailed report in *The Naturalist* when all the material has been brought together which comprises the year's work.

Hymenoptera (R. Butterfield) :—Dr. W. J. Fordham reports the following species new to Yorkshire, or V.C. 61, from Allerthorpe Common, *Psammochares rufipes* L., *P. nigerrimus* Scop., *P. consolvinus* Dbm., *Sphecodes reticulatus* Th., *Andrena precox* Scop., *A. lapponica* Zett., *Solenius vagus* L., *Thyreopus peltarius* Schr. From the same place Mr. R. Butterfield reports as new to County, *Anthophora furcata* Panz., *Colletes picistigma* Thoms., *C. fodiens* Kirb., *Epeolus rufipes* Thoms., and also as worthy of mention, *Halictus tetrazonius* Kl., *quadricinctus* Fab., and *Andrena fuscipes* Kirb.

Mr. John Wood obtained a female *Rhopalum tibialis* Fab. near Keighley, this being the first report of this sex for the County. He also caught *Sirex cyaneus* in the streets of Keighley. *Omalus auratus* L. is reported from Barnsley by Mr. E. G. Bayford, and *Paræodrus apterogynus* Hal. (Proctotrypidæ) from near Leeds by Mr. G. C. Johnson. A female *Mutilla europœa* from Cleveland district was exhibited at the annual meeting Entomological Section.

Mr. A. E. Bradley has continued his investigations on varieties of Bombus and Psithyrus.

(*To be continued*).

———: o :———

'The Influence of Certain Salts upon the Hatching and the Development of Salmon Larvæ,' by M. Ramult, in excellent English, illustrated by plates, is printed in the *Bulletin International de l'Academié Polonaise des Sciences et des Lettres*, issued at the University of Cracow.

In *The Sphere* for January 14th, Mr. C. J. Cutcliffe-Hyne describes how he assisted in erecting some stone structures on the Pennines. To these the name 'Seven Pins' was given, and they are now in guide books and on the Ordnance Survey maps as 'Druidical Remains.' His article is headed 'Concerning Glozel.'

Y.N.U.: ENTOMOLOGICAL SECTION.

W. D. HINCKS, M.Ph.S.

The Annual Meeting of this Section was held on October 29th, 1927, in the Library of the Leeds Museum. Mr. C. A. Cheetham occupied the chair. The exhibits were numerous, and accompanied in many cases by interesting notes.

Coleoptera.—Mr. M. L. Thompson showed specimens of *Oxypoda umbrata*, *Actobius cinerascens* and *Cantharis darwinianus*, and Mr. W. D. Hincks exhibited a living bred example of *Rhagium mordax*.

Mr. T. K. Kitchen mentioned having seen the glow-worm (*Lampyris noctiluca*) exhibiting its light on January 11th, an unusual time of the year for such an insect to be at large. Mr. A. E. Winter remarked that he had met with it at Aysgarth during January, 1917, and also handed round some interesting lantern slides of the developmental stages of *Meloe* (the oil beetle), showing the primary larva or triungulin.

An account of a specimen of *Coccinella bipunctata* observed eating a live Anthomyid fly was read by E. G. Bayford.

Mr. G. C. Johnson read notes on the occurrence during the past season of injurious coleoptera, including the turnip flea beetle, asparagus beetle, and pea and bean weevils. With reference to the latter insects, Mr. Lyle mentioned the work of Miss Johnson on the parasites of *Sitona*. Mr. Johnson also put out for exhibition glass dishes containing living ♂ and ♀ *Ocypus olens*, and eggs and young larva.

Hymenoptera.—Mr. M. L. Thompson: A specimen of *Mutilla europæa* from Cleveland. Mr. E. G. Bayford: A new Yorkshire Chrysid, *Omalus auratus*.

A fine ♀ *Sirex gigas* from Blackmoor, near Leeds, was shown by Mr. J. R. Dibb, and Mr. Bayford read a note on the ravages caused by *Sirex* on a leaden gas pipe.

Mr. G. C. Johnson: A new Yorkshire Proctotrupid, *Paracodrus apterogynus*, bred from *Agriotes* sp. This insect is very rare in Britain.

Diptera.—Mr. C. A. Cheetham: Species added to the Yorkshire list during the year. Mr. W. D. Hincks: Two boxes of *Syrphidæ* and specimens of *Tabanus bovinus* and *Echinomyia grossa* from the New Forest.

Mr. E. Percival described the larval habitat of *Orphnephila testacea* which he had found on rock faces subjected to the constant dripping of water at Sedbergh. The gelatinous tubes of *Dicranomyia* larvæ were also present, and *Dixa* larvæ occurred in the same habitat.

Mr. B. Morley: Two Tachinid flies bred by him, *Ernestia consobrina* from *Acronycta rumicis*, and *Parexorista cheloniæ* from *Arctia caia*. Mr. G. C. Johnson: *Thereva nobilitata* bred from larvæ which may be found in any garden, yet the fly is scarce and never found in gardens, always on sandy commons such as Allerthorpe.

Hemiptera.—Mr. M. L. Thompson: *Crytorrhinus caricis*, *Orthotylus concolor* and *Acocephalus trifasciatum*.

Lepidoptera.—Mr. B. Morley showed *Fumea intermediella* and remarked on the difficulty he had experienced in breeding this species. He also showed *Boletobia fuliginaria* and *Feltia eribis*. The former is a London species, though the specimen shown was taken in Yorkshire. The latter is a North American species occasionally found in this country. The old specimen exhibited had almost certainly been taken at Huddersfield.

Mr. Beanland: A specimen of *Melitæa cinxia* taken in Shipley Glen. Almost certainly it had been released by some collector, as the only British station is the Isle of Wight.

Mr. G. H. Nash: Some very fine cases of life histories; they included the Cinnabar, Garden Tiger, Vapourer, Gold-tail, Small Cabbage, Buff-ermine, Magpie, and V-moth. With regard to the Vapourer, Mr. Morley said the larvæ occured on heather and bilberry, a fact not mentioned in text-books.

Mr. A. Thornes : Varieties of *Polyommatus plœas* (var. *schmidtii*), *Arctia caia, Spilosoma lubricepeda, Lysmantia dispar,* etc.

Mr. G. C. Johnson showed a piece of blackcurrant wood with hibernating larvæ of *Porthesia similis in situ.*

The evening meeting was devoted to the reading of recorders' reports and to the nomination of officers.

J. M. Brown, B.Sc., F.L.S., F.E.S., was nominated President for the coming year.

The committee reports all agreed that the past season had been a poor one, though a few novelties had put in an appearance. In view of the paucity of records of the dragonfly, *Cordulegaster annulatus,* in Yorkshire, the following were reported : Taithes Gyll, Sedbergh ; Keighley, Austwick ; Pateley Bridge.

Mr. R. Butterfield read a short paper comparing the Aculeate fauna of Allerthorpe Common with that of the Keighley district, of which the following is a summary :—

There is an astonishing difference between the dominant species in the lowland East Riding and the hilly parts of the West Riding. In the East Riding there are fewer individuals, but a much greater number of species, especially of the solitary or non-social kinds.

Allerthorpe Common is not elevated much above sea-level (about 50 feet), it is a part of the lowland plain of York, and there are no hill barriers in the south. The average annual rainfall is a little over 20 inches, whereas at Keighley (about 300 feet altitude) the average is nearly double. The aggregate annual amount of sunshine is thus much greater in the East Riding.

Genera, which are well represented in the sunny plain of York, are absent or nearly absent in the Pennine district. Mr. Butterfield had never seen a member of the *Anthophora* in the Pennines or at the foot of the Pennines. The *Anthophora* are not unlike small bumble bees, but are of solitary habits. One of the first bees he saw at Allerthorpe was *A. furcata,* which proved to be fairly common. All the British species thus occur in Yorkshire, but none, to his knowledge, in the hilly west. The late Professor Miall gave *Anthophora* as the host of the larvæ of the oil beetle. Mr. Butterfield had seen dozens of times the primary larvæ of *Meloe* around the burrows of *Andrena* and *Halictus* and has often seen larvæ attached to species of both genera.

The *Obtusilingues, Colletes* and *Prosopis* are well represented and common at Allerthorpe, but he had not seen an example in the hilly west, nor had he heard of any having been seen.

The leaf-cutting bees are quite at home at Allerthorpe, but west of Leeds they are very scarce.

The inquiline bees attached to these groups occur at Allerthorpe and are naturally absent in the west.

There are also genera of fossorial hymenoptera which seem to avoid the hills of the Keighley district.

A few hardy species seem to have gained dominence in the west, and certain species of *Andrena* and *Halictus* occur in suitable localities in countless numbers. The social species are well represented, and the aggregate number is great.

Of the solitary species *Andrena albicrus* and *Halictus rubicundus* occur nearly everywhere. The *Halictus* is the only large species we get. He had examined hundreds and have not seen one of the closely allied species, yet the next species to it turned up at Allerthorpe, viz., *H. quadricintus.*

Further investigations in the plain of York, especially the few sandy commons, would still add to our knowledge of the Aculeates.

CORRESPONDENCE.

THE END OF THE CARDINAL.

The Red-crested Cardinal (*Paroaria cucullata*), which put in a sudden appearance early in September, in the upper part of the village of Baildon (*ante* p. 59), settled down in the same gardens and remained for about three and a half months. It was last seen on December 20th, in very cold, snowy and frosty weather. It did not look at all well on that day, and had its wings drooping. It was a great favourite, and many were the wishes that it would return ; but they have been in vain.—H. B. Booth.

——: o :——

The death is announced of John Hartley Durrant, the entomologist.

Prof. J. L. Myres is the new president of the Royal Anthropological Institute.

Professor P. F. Kendall, a Past President of the Yorkshire Naturalists' Union, has been placed on the list of Honorary Members of the Institution of Waterworks Engineers.

In Part LXVIII. of S. S. Buckman's *Type Ammonites*, *Ammonites antiquatus* Simpson, from Robin Hood's Bay, now called '*Macrogrammites antiquatus* Simpson sp. Schlotheimian *megastoma*,' are figured.

In his report to the Farne Islands Association for 1927, the Honorary Secretary, Mr. C. F. Thorp, reports that during the summer of that year a small flock of Crossbills visited the Brownsman Island, and stayed for several days.

J. E. Collin's Presidential Address on ' The Recent Growth of Interest in Entomological Science and its Effect upon Entomologists and Entomological Societies,' read before the Entomological Society of London on January 18th, has been published.

——: o :——

H. F. Barnes describes ' British Gall Midges ' in *The Entomologist's Monthly Magazine* for March.

From Mr. Hans Schlesch we have received *Kleine Mitteilungen II.*, reprinted from *Archiv fur Molluskendunde* ; and *Notes sur L'Hydrobia jenkinsi*, reprinted from the *Journal de Conchyliologie*.

The Director of the Newark Museum, New Jersey, has reprinted the article on ' Lessons from America in Museum Organization and Upkeep,' by C. Reginald Grundy, which originally appeared in *The Museums Journal* for distribution among the members of The Collectors' League of New Jersey.

In *The Entomologists' Record* for February G. T. Bethune-Baker protests against the removal of the statue of Darwin in the Natural History Museum, and refers to the matter as a sacrilege. In the same journal, in ' Somatic Mosaics and Mutations,' E. A. Cockayne refers to the work of the late G. T. Porritt among the *Abraxas*, etc., near Huddersfield.

The Essex Naturalist, covering the period October, 1927, to March, 1928, contains the following notes, the last named being illustrated by a photograph : ' Remarkable Gall on the Osier,' by the late Miller Christy ; ' The Hepatics of Essex,' by the late St. John Marriott ; ' Notes on the Solitary Bees and Wasps of Essex,' by Charles Nicholson ; and Obituary : Miller Christy.

The Vasculum for February contains, among others, the following interesting notes : ' Excavations on Hadrian's Wall,' by F. G. Simpson ; ' Some Derwent Valley Birds,' by J. E. Ruxton ; ' The Freshwater Sponge in the Streams of the Cheviot District,' by Rev. G. Ord ; ' Melanic and other Varieties in *Polia chi* L.,' by J. W. Heslop Harrison ; ' The Gall-Wasps and their Allies in Northumberland and Durham,' by R. S. Bagnall ; and '*Cyclamen hedeæefolium* in Northumberland,' by A. W. Bartlett.

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NOTES AND COMMENTS.

POLLUTION OF THE NIDD.

We learn from *The Yorkshire Post* that 'Mr. J. H. R. Bazley, of Leeds, has, on behalf of the Knaresborough Amalgamated Anglers' Club, made an inspection of the River Nidd in the Club's area, and in his report he says :—' The bottom of the river is covered from end to end with a brown fungoid growth, apparently of sewage origin. Wherever the water is steady, either in the shallows or deeps, the stones are completely covered with it, and the weeds are also coated with the same slimy mess. It follows that all aquatic life has long ago been smothered out of existence, and I have never examined a more barren stretch. This accounts for the concentration of what fish there are on the fast runs, as the more quickly moving current tends to prevent the formation of the growth indicated, and also provides breeding places—although rather precarious ones—for the various forms of fish food.'

UNCHANGING NATURE.

In an abstract of Mr. J. S. North's Presidential Address, with the above title, to the Brighton and Hove Natural History and Philosophical Society, appearing in the Society's Report, he refers to the enormous progeny of many forms of animal and plant life. The aphis (or green fly) of our rose trees will produce, with the progeny of its descendants, eleven generations in one year, and if all the young lived, one aphis would multiply in one season to a number expressed by 22 figures, viz., 1,000,000,000,000,000,000,000 ; or, as one naturalist has put it, if a hundred of these creatures weigh one grain, the fruit of one aphis at the end of the summer would weigh two billion tons, which is more than twenty times the weight of all the inhabitants of the world. Where a plant or animal is introduced into new surroundings, it will often increase at a most extraordinary rate. Sixty years ago there were no rabbits in Australia, then three were sent out from London. Forty years later 25,000,000 frozen rabbits and 96,000,000 rabbit skins were shipped to Europe from Australia.

THE ELLISON FOSSILS.

We learn from the press that ' Five cases of geological specimens in the Ilkley Museum, known as the Ellison Collection, have been sold by the Ilkley Urban Council to Keighley Corporation for the Keighley Museum, and the collection is now in process of removal. The collection was made by the late Mr. James Ellison, of Silsden and Steeton, and was purchased from him for £100 by the Ilkley Museum and Antiquarian Society, which founded the Ilkley Museum in 1892. Recently, the Council have sought to develop their

Museum on definitely local lines, and as the museum area is very restricted, specimens of a general character are being removed. It is this which has led to the sale of the Ellison Collection.'

MOSQUITOES AND MILK.

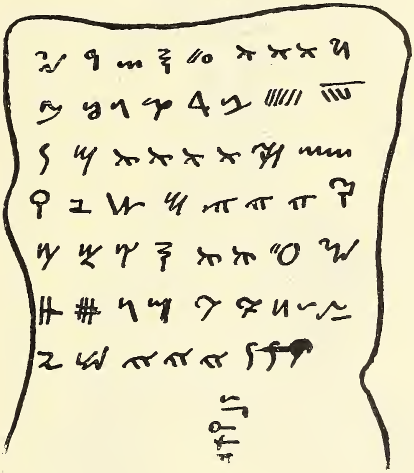
In *The Entomologist's Monthly Magazine* for March, J. G. Myers records that ' In North Essex in the autumns of 1926 and 1927 I noticed a peculiar feeding-habit of the common mosquito, *Culex pipiens* L. (kindly determined by Mr. F. W. Edwards), under conditions which may well have prevailed for a number of centuries. The scene was an ancient farmhouse, at least 450 years old, where the milk is still exposed in huge earthenware pans in order that the cream may rise and be skimmed. The dairy is a white-washed, low-ceilinged room forming part of the main dwelling-house, and furnished with a latticed opening facing about south. This opening is sometimes shuttered at night, but not sufficiently to prevent the entrance of mosquitoes. On September 28th, 1926, I caught resting on the white walls and ceiling of this dairy no fewer than 226 female mosquitoes—all *C. pipiens*—practically all of which, as shown by dissection of a large number, had been feeding on skim milk. The pans, with milk of different ages, are not always in the same position on the shelves. Milk ready for skimming might be found in one corner one week, in another the next, and the greatest aggregation of mosquitoes was invariably in the vicinity of the long-standing milk.

GLOZEL.

We learn from a contemporary that ' the dispute over the discoveries at Glozel has not yet ended, and M. Reinach continues to use every opportunity to express his disagreement with the verdict of the inquiry Commission. The article he published in *Discovery* was itself a masterly array of such facts as support his views, and he is now making the most of his opponents' failure to explain the occurrence of the site. The latest round in the " battle " has been fired in a letter to *The Times* by Sir Arthur Evans, who gives new evidence that the objects were of recent date. The chief technician of M. Reinach's own museum, it appears, has now been sent by the French Minister of Education to make an expert examination of the objects ; and he shows that the cylindrical borings of the stone implements have been executed by steel tools, the engraving equally by metal points, and that the finished surfaces of the stone axe blades also bear the undoubted scratchings of metal files. If this new report should be substantiated by other experts, the only remaining problem would seem to be a matter for the police.'

THE LAST WORD.

Another scientific contemporary, *The Daily Chronicle*, says, ‘ Everyone interested in archæology will breathe a sigh of relief on learning that the acute controversy has now been settled by the discovery of an inscribed stone, of which I give a picture here, at a depth of eighteen hectometres below the surface of the ground in the heart of the Glozel district. A glance at this will show that the Anti-Glozellians have not a leg to stand on, and probably wish they had never been born. I append a translation for the benefit of those who are not acquainted with the Glozel language. We, the prehistoric inhabitants of Glozel, being of sound wind and limb, solemnly, knowingly and of malice aforethought declare that all the relics found in this neighbourhood are genuine, that they contain no boric acid or other preservative, and are, in all respects, what they profess to be. We add that those earthworms who cast aspersions on the genuineness of these relics are dirty dogs and no gentlemen. In testimony thereof we append our signatures : Ag, Eg, Ig, Og, Ug.’



SCIENCE PROGRESS.

In *Science Progress* for April, G. W. Tyrrell refers to ‘ interesting and unusual [thank heaven !] pegmatite dykes associated with a Caledonian peredotite-anorthosite-gabbro-diorite mass in the island of Seiland.’ He also tells us that ‘ L. J. Grange has conclusively shown that the so-called “ rodingite,” consisting of grossular and diallage, is not a primary igneous rock at all, but is due to the alteration of gabbro, the grossular being secondary after calcic plagioclose.’

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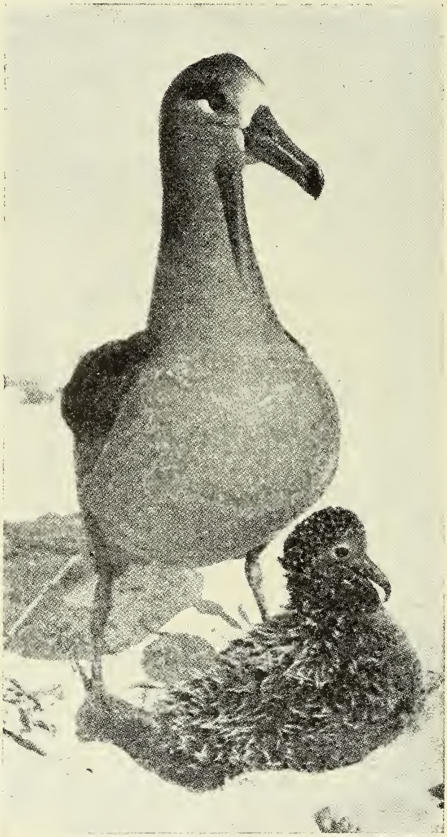
BIRDS OF THE OCEAN.*

The author has spent a considerable time travelling in various parts of the world, and during his rambles has been keenly interested in the bird life he met with. The number of species seen on the ocean is extraordinarily great and varied, and a description is given of most of them. In addition admirable photographs (one herewith shown) by different authorities are reproduced, some being of species familiar to English ornithologists. Others relate to varieties only to be met with in distant corners of the world.



Black-footed Albatross and Young.
Laysan, Hawaiian Islands.

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* By W. B. Alexander. London : G. P. Putnam's Sons, xxiii.+428 pp., 15/- net.

RARE BIRDS AND MUSEUMS.

The Spring issue of *Bird Notes and News* provides two interesting items. The first is :—It is good to read of the protest made by one of the Governors of the Royal Albert Memorial at Exeter against the shooting of strange birds which visited the locality. The report of the Museum Committee, said Mr. Vincent Thompson, stated that three Bitterns, a Tufted Duck, a Black-necked Grebe, a Great Crested Grebe and a Great Northern Diver had been shot in the Exe estuary, or the Exe valley, and presented to the Museum, and that the thanks of the Committee were to be conveyed to the donors. He thought the donors should not be thanked for these gifts. It was a million pities that the birds should be killed [and killed illegally]. A second speaker expressed absolute agreement with this ; there was no reason why the Bittern should not breed again in the valley of the Exe ; and general feeling was clearly on the same side. No doubt it is far better that rare birds, when killed, should find a home in the local Museum ; and it would not be a bad thing to order by law the transit thither (for preservation or otherwise) of every rare bird killed, but the label should always record regret at the shooting and, if possible, the conviction of the shooter. For this the R.S.P.B. has always made requisition, and the request has usually been acceded to.

CUCKOOS.

On this subject we learn that two variants of the Cuckoo story have been contrived by man, and afford a change from weary disputes over the actions of the bird itself. Mr. F. Gillett Cory relates in *Country Life* (10th March) how he tried to preserve an entire family, legitimate and otherwise, by replacing Meadow Pipit nestlings in the nest several times after they had been evicted by the blind baby Cuckoo, thus giving the latter the portentous task of climbing the nest-side 45 times. The Cuckoo was then put into one half of an enlarged and divided nest, the young Pipits in the other half, with the result that the parent Pipits fed all, and the Cuckoo made no murderous attacks on its neighbours. But for some reason, all died, perhaps from exposure, perhaps from over much handling. In the second story, told by Mr. Henry Williamson in the *Daily Telegraph* (16th March), the Cuckoo's egg was taken, newly-laid, from a Longtailed Tit's nest and placed with the hard-set eggs of a Starling. The Starling chicks, hatched first, were too lusty and heavy to be ejected, and all went well. This seems the better scheme of the two. The youngsters had not to be pitched out and rescued, nor the intruder overworked, and there was no tragedy : the Starlings survived to eat wireworms and cherries, the Cuckoo to deal with hairy caterpillars.

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RARE BROADSHEET BY W. SMITH, GEOLOGIST.

Through the courtesy of Dr. F. J. North, of the National Museum of Wales, Cardiff, a photograph of a Broadsheet which appears to be the only copy extant of a paper by William Smith, the Father of English Geology, has been placed in the Hull Museum. Its interest lies in the fact that its date of publication is three years later than that of his 'Synopsis of Geological Phenomena,' hitherto believed to be his last separate publication, and it deals with some of the aspects of Geology then in dispute. It is the only occasion on which he gave expression to his thoughts upon these matters, and shows that he was not favourably disposed to the Uniformitarian School of thought introduced by James Hutton, and expounded by Charles Lyell in his 'Principles of Geology.' There are reasons for supposing that this paper was actually in the nature of a rejoinder to Lyell: this, and other matters relating to the Broadsheet are referred to in *The Geological Magazine*.*

The document measures about 15 ins. by 11 ins., and begins: 'As doubts may remain in the minds of many on the Principles of Geology, I shall endeavour to exhibit the principles, long familiar to my mind, in a clear view, opened by the organized Fossils, which are the medals of Creation, the antiquities of nature, and records of time. It is certain, that by the use of these in Geology, we are carried back into a region of supernatural events, not merely to believe, but to see much of what there occurred; yet beyond a certain extent we cannot go: therefore, we must be content to pass over the primitial interior of the Earth, and see that in the Stratification there have been Consecutive Creations and Destructions under water, which may be thus arranged.

Deductions from Established Facts in Geology.

I.	II.	III.
Creations of Solid Inert Matter.	Creations of Animal and Vegetable Life.	Destructions of Life Physical and Supernatural.'

It is signed 'William Smith, Scarboro', July 21st, 1835,' and was 'printed by C. R. Todd, Printer, etc., 73 Newborough Street, Scarborough.'—T.S.

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The Entomologist for April contains a memoir on the late J. H. Durrant, with portrait; an illustrated note on the 'Variation of *Pieris napi*,' by F. W. Frohawk; and 'Notes on British Orthoptera,' by W. J. Lucas.

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* Vol. LXIV., December, 1927, pp. 532-540.

COAL AND IRON WORKING IN THE MILLSTONE GRIT AND YOREDALE ROCKS OF WEST YORKSHIRE.

DR. A. RAISTRICK, F.G.S.

UNLIKE the mining of lead, the working of coal and iron in the West Yorkshire Dales is not traceable earlier than the thirteenth century. Some writers have shown that the Romans used coal in other parts of the county, but no evidence of such use is to hand in this area, and we must regard the mining of coal as an industry entirely of mediæval origin. The first coal to be used was that occurring as outcrop and drift coal along the shores of the Forth, hence the name 'sea-coal,' but by the middle of the thirteenth century coal was being worked inland, in Northumberland and Nottinghamshire, and by the end of the century in South Yorkshire. The greater part of this early coal was being sent to London, or used in the larger monasteries and castles, and the mines were largely the perquisites of the monasteries or the feudal overlords. In the Compotus of Bolton Priory there are entries in 1294 for the purchase of sea coal* for their forge, and in 1311 they were digging coal in their own pits, on the Aket Pits, Hebden Moor, an area already leased to them for lead working. The Pipe Rolls of 1296 include notice of a mine of sea coal, New Forest, Arkengarthdale, which in that year gave a profit of 12d. In 1304 a mine of sea coal was granted in Kirk Gill, Colsterdale, and this soon became a valued possession of Jervaulx Abbey. This mine was owned in part by John de Walton (two-thirds share), and was worth in some years 53s. 4d., and must, therefore, have been of considerable size. The monks of Jervaulx obtained a grant of this mine in 1333 and paid eight merks per year for the rights of mining, and a 'way-leave' of twenty quarters of coal to the Lord of Mashamshire, for rights of cartage across all or any of his lands. In 1384 the accounts of the steward of Richmond Castle include the purchase of one and a half quarters of sea coal at 10d. a quarter, and three years later the coal is stated to be from the lord's mine at Takkan Tan (Tan Hill), which belonged to the Earl of Richmond, and 'was not accounted for this year (1387-8) because Lord de Clifford claims the soil unjustly';† the yearly lease was four merks. It is a great point of interest that the Cliffords should so early claim this mine, which in the seventeenth century was providing the coals used by

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* MCCXCIV. In Carbon marin. ad forgiam, xs.

† Gale. Reg. Hon. de Richmond. 100.

Lady Anne Clifford at her castles of Appleby and Brough. In the fifteenth century there are occasional references to mines in Swaledale ; the Lord's Mine in Arkengarthdale, mentioned in the thirteenth century, is still working ; and new mines are granted in Whitgill and Eastgill, near Keld. Throughout this earlier period the coal was worked for the monasteries or for Richmond Castle, while for the rest of the community wood was the only fuel. The accounts of both castles and abbeys show that the coal was used with a large amount of wood, and was at most only an occasional fuel, except for the blacksmiths' forges, a few of which seem to have used coal alone, for heating and working iron already smelted by charcoal.

During this period just reviewed, iron working and mining was going on alongside the coal working, the chief makers and users of iron again being the monks. The first mention of iron in North-west Yorkshire is of an iron forge and smelting furnace in Lunedale Forest (Teesdale), which in 1235 was sublet by one Ranulf. In 1250 the Grange of Jervaulx had an iron mine in Colsterdale, and Sir John de Walton bound himself and heirs never to raise a forge in Colsterdale, nor give nor sell iron mines therein so as to prejudice the Grange. At the same time Bridlington Priory obtained a grant to dig, work, and smelt iron at Blubberhouses, and several scoria heaps remain to attest the good use they made of their grant ; in 1285 their iron-master, Adam Fox, paid £25 for the forge, a very high price compared with those paid to Peter de Brus, in Cleveland—five forges, vauled 5s. each, and two large forges, £4 each,* and suggesting that the Blubberhouses iron works were on a fairly large scale, having several large forges. All the monasteries in the early thirteenth century sought grants to obtain iron, and while Kirkstall and more southerly houses obtained good leases in the coal measure ironstones, the northern houses had to be content with the poorer ores of the Millstone Grit and Yoredale rocks, or had to purchase and carry ores at considerable expense from the Coal Measures. St. Agatha's Abbey, Easby, had a share in an iron forge in Garsdale, while Fountains Abbey had two forges in Nidderdale, one at Dacre, and one higher up the valley. The forges used in the thirteenth and fourteenth centuries were small, and served by hand bellows, as illustrated in some of the illuminated scrolls of that period, but in 1408 an iron furnace was erected in Weardale (Durham) with 'water-bellows.'

During the fourteenth century, chimneys, which had been practically confined to monastic kitchens, began to be built in some of the halls and castles, and coal as a domestic fuel slowly came into use. Bolton Castle was one of the first Yorkshire castles (1380) to be built with proper chimneys to the main rooms, and a few years after its completion, coal was being dug on Preston Moor as fuel for the castle. Leland has a quaint comment on the chimneys at Bolton : ' One thinge I much notyd in the haulle of Bolton, howe chimneys were conveyed by tunnells made on the syds of the wauls bitwixt the lights in the hawll ; and by this meanes and by no covers, is the smoke of the harthe in the hawle wonder strangely convayed.' The coal seams worked on Preston Moor were in such position that their depth rapidly became too great for bell pit working, and on the exhaustion of the outcrop, the coal pits were closed, and new ones opened in West Witton. With the dissolution of the monasteries in the sixteenth century ended the iron trade in the dales, the Sussex iron-master now sending all iron that was needed in the north. The only new grant of a mine in this century was the coal mine at Hawes, in 1583. By the seventeenth century coal had taken its place as a general domestic fuel, Howes, writing in the reign of James, says, ' The fore said sea-cole and pitt cole is become the general fewell of this Britaine Island, used in the houses of the nobilitie, cleargy, and gentrie in London and in all other cityes and shires of the Kingdom as well as for dressing of meate, washing, brewing, dying or otherwise.'

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* Furness Coucher, pt. iii.

Although in this century most of the mines were still owned by the nobility, leases were much easier, and we find frequent items in castle accounts of ' rent of a coal mine, etc. New mines opened in the dales during this century include Whitcliffe, near Richmond, Grinton, East Witton, and Masham, while the chief event affecting coal mining in this area was the formation in 1692 of the London Lead Company, with a charter for smelting lead with pit coal and sea coal, and extensive leases in Teesdale.

In Lady Anne Clifford's diary frequent items occur as follows :—

> ' Aug., 1673. Payed the 16 day John Swewell Richd. Browne and other both of Brough and Warcopp for eight Score and two loads of coales from my owne pitts on Stainmoor at 12d. per load for firing for my house at this Appleby Castle comes to in all eight pounds and two schillings. £8 . 2 . 0,

and several items showing the cartage of coal from her own pits to her castles at Brough and Appleby. At the same time the provision of coal for Skipton Castle from the coal on Embsay Moor was made a condition in a Skipton lease of land.

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In 1670 the mines of lead and coal in the Greta valley were conveyed from a group of holders to Sir John Lowther.

In the eighteenth century the London Lead Co. were working coal in Teesdale, and taking some of the output of coal from the Greta valley, and possibly from Tan Hill, for their new smelt mills. The use of coal in lead smelting was rapidly extended through the dales, and the Keld Heads Lead Co. opened out several of the Yoredale coals, chiefly below the Main Lstn., from a new shaft, the 'Coal Shaft' in their lease on Preston Moor. Two collieries deserve particular attention at this time, Silsden and Masham. Dr. Richard Pococke, travelling through the country, passed southward across the dales, and passing from Wharfedale, says,

> 'We crossed the moors on the River Aire to Silsden, where there is an old house or hall of the Earl of Thanet. The moors we passed are full of coals, and a horse load of twenty stone of sixteen pounds each sells for fourpence at the pits.'

The price alone is worth attention nowadays. This coal pit is one of the few in the Millstone Grit still working.

The colliery at Masham was described by Young in his 'Tour of the North of England,' 1770, as employing many hands who worked a 12-hour shift, midnight to noon, and to supplement their wages were assisted to inclose the moorland in small holdings, and to market the produce of the gardens so formed. This mine was the property of Mr. Danby, of Swinton, and supplied much of the coal used in the Ripon and Masham districts. The mines were, however, still few and far between, and the majority of the people in the dales must have been entirley dependant on peat as a fuel. The principal development of the nineteenth century was the opening up of small pits in almost every locality where coal could be found, thin coals down to 10 inches being used for local needs, and thicker coals rapidly finding a fairly wide market, though still local to the dales. The chief coals worked in this period of expansion were in the base of the Millstone Grit, and the coal below the main limestone. When the Coal Mines Acts were passed, there were twelve collieries registered in the dales, employing about fifty men. To-day there are only seven pits working, employing twenty men.

Although the nature and correlation of the Yoredale and Millstone Grit coals is the subject of another inquiry, it will be well to indicate which coals have been worked in the past, and which are still worked to-day.

The Tan Hill Coal, one of the few coals to be worked almost continuously from the thirteenth century to the present, and still worked by two of the most active collieries in the

Dales area, occurs on parts of Stainmoor, a few feet above the base of the Millstone Grit. It averages about 4 feet in thickness, the seam usually being in two parts, separated by a few inches of dirt. Around the head of Punchard Gill and Blakethwaite Moor, another coal, about 2 feet, but very poor quality, occurs at the actual base of the grit, and was worked for a time along with the Tan Hill Coal, for use at the smelt mills at Blakethwaite and Old Gang. Coming south, the Tan Hill Coal is found and has been worked on Great Shunner Fell, though here another coal below the Upper Howgate Grit occurs, and it is difficult to tell in the case of the West Pit Colliery, the largest coal winning in Wensleydale, which of the two has been worked. The position of some of the shafts would suggest that both have been wrought at a few sites, if not at all, on the fells east of Shunner Fell. In Colsterdale and Nidderdale the coals associated with the Red Scar Grit were those used, and the ironstone nodules provided the iron ore worked by the Jervaulx monks. In Wharfedale the coal at the base of the Grassington Grit was extensively worked around Buckden Pike for the use of the smelt mills at Kettlewell and Starbotton. During last century the coal was sent down by pack mules to the smelt mills, and a considerable surplus above the needs of the mills was sent to Skipton market. About the middle of the century the Skipton trade was supplied by a group of collieries on Threshfield Moor working the same coal.

Among the Yoredale rocks the chief coals worked have been the one below the Main Limestone, and, in the north, one about the horizon of the Fell Top Limestone. The coal between the Main and Undersett Limestones is the one exploited at the famous Garsdale Pits, which for a long time were supplying Sedbergh and Kirkby Stephen, as well as the local needs of the dales. This colliery was one of the few in the Dales area, working by shafts, and not by adits on the outcrop. The shafts reached to 120 feet deep, and winding was entirely by hand windlass. These mines were very wet, and only the primitive method of lifting water up the shaft in buckets was used to meet water troubles.

With the exception of the Garsdale and Tanhill Pits, most of the mines were small enough to be worked by owner miners, so very little information can be gathered relating to wages. Accounts do show, however, that in the sixteenth century, 3d. to 4d. per day was being paid in North Yorkshire to coal hewers and drawers, while at the same time other items are as follows :—to a new corf, 4d. ; for a winding rope, 2s. 6d. ; a windlass, 2d.. In the early eighteenth century the miners at Garsdale were getting 6s. a week, and about 1850, boys had 7s. and miners 14s. for a full week.

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The miners had to provide their own candles, knee pads, trappings, and chains (to drag the tubs), blasting powder and tools. As at Masham, the working shift was midnight to noon. Coal from the Garsdale pits was sold at 5s. per load of ten hundredweights. These pits were closed about 1860.

It seems improbable that the numerous small coal pits in this area will again re-open, except as in the recent Mining Lockout, when many of them were brought into emergency use, as the rail and motor transport has brought the Durham coal into most parts of the dales. There is one possible development, however, where the local coal could be used to advantage, that is in lime burning for the use of the farmers; most of the lime now on the market being too expensive for their use. The occurrence of the fairly good coal adjacent to abundant limestone would make limeing a very cheap matter for most farms, after the first exertion of re-opening outcrops, and repairing the very numerous lime kilns which in the past were good customers of the pits.

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Early Nesting of Jackdaw.—Towards the end of February a Jackdaw's nest, containing three young birds, was discovered in the chimney of a house, occupied by Mr. Norman Scott, in Rupert Road, on the Myddleton side of Ilkley. One young one was taken with the intention of rearing it by hand, but, unfortunately, it died. The others left the nest about the last day of February; which means the eggs would have been laid in the first half of January. The weather during these two months had been mild, but exceptionally wet. The particular chimney is used to take away the fumes of a gas stove! I have to thank Mr. A. Haigh Lumby for first directing my attention to this matter.—H. B. Booth, Ben Rhydding.

A Waxwing at Thornton-le-Dale, North Yorks.—Mr. J. Green, of Thornton-le-Dale, desires me to record that he saw a Waxwing on March 17th, 18th, and 20th, on waste land by the side of the road to Whitby, about 200 yards from his cottage. He noticed it feeding on the fruit of the wild rose, swallowing the berries whole. Its tameness impressed him more particularly, for when he stood about eight feet from the place where the Waxwing was feeding it manifested no sign of fear. On one occasion Mr. Green observed it drinking water, which had accumulated in a cart rut, and he stated that the small birds, also thrushes and blackbirds, appeared from their behaviour to resent its presence. After the Waxwing had eaten all 'the hips' it apparently went away, for he did not see it again.—R. J. Flintoff, Goathland.

NORTHERN GEOLOGICAL SOCIETIES.

Proceedings of the Hull Geological Society, Vol. VII., Part 1.

' The Relations of Palæontology to Stratigraphy ' is the title of the first paper in Part 1 of Volume VII. of the *Proceedings of the Hull Geological Society*. As would be expected from its highly-gifted author (the late G. W. Lamplugh), this paper is extremely entertaining ; it combines solemn warning with good-humoured banter. The author comments almost feelingly on the changes in nomenclature that seem inseparable from modern studies in any group of fossils ; he is inclined to be sorrowful to find that the old-fashioned familiar names of the commoner fossils are really only ' omnibus ' or ' collective ' names. We will quote one playful passage : ' The modern palæontologist says in effect, "You must not use a name unless you use it correctly (*i.e.*, as I myself should use it), or else you will deceive me." ' In this very attractive way we are reminded of Hobbes' well-known definition of a name, as ' . . . a word taken . . . to serve for a mark . . . which, being pronounced to others, may be to them a sign of what thought the speaker had before in his mind.' This is the ideal which the modern palæontologist has ever in his mind. Hence his strict regard for an original type-specimen ; and his frequent use of ' aff's ' and ' cfs,' commented on by the author. Inspired by this ideal, the workers of to-day are laying the foundations of what will doubtless prove to be a sound system of palæontological nomenclature.

View of the new Section in the Glacial Gravels at Paull Holme, E. Yorks.

The references to the fact that fossils in most cases represent only the hard parts of the animal (the ' mere skeleton ') should perhaps be read in conjunction with Henry Shaler Williams's remarks on the same subject (*Geological Biology*, p. 98).

The able author refers to cases being ' referred back ' to the palæontologists. Most palæontologists can call to mind cases where they have referred back to the stratigraphers. It should be fairly easy for the stratigrapher to make correlations and build up a thesis when he is told by the palæontologist that, say, this clay is here the argillaceous equivalent of a formation that is elsewhere a typical limestone, and that another formation is altogether missing. In which connexion the young student would do well to remember that the term ' stratigraphy ' as used forty years ago would to-day probably be changed to ' geological cartography.'

The second paper, ' Notes on Occasional Floods on the Yorkshire Wolds,' is also a posthumous work by the same author. It deals with floods at Langtoft, which occurred in 1888 and again in 1892. Torrential rain fell at a rate that overtaxed the absorbing capacity of the ground, and the excess revived ancient conditions, and so flooded the dry valley.

Other papers include an account of ' The Clays on the Foreshore at South Ferriby, Lincs.', by W. C. Ennis. At this locality the presence of the Lower Kimmeridgian is proved by the finding of the ammonite *Rasenia*. Speeton fossils were at one time to be collected from the Boulder Clay on the foreshore, but are not now obtainable.

Mr. T. Sheppard writes on ' Recent Sections in East Yorkshire Glacial Beds.' His paper, which is illustrated by one plate and a text-figure, deals, among other items, with the finding of numerous mammalian remains at Paull. The frequency of these recent finds is attributed to modern methods of quarrying, which enables sections to be cut deeper. Even after careful search here, however, not a single fragment of *Corbicula* has been found recently* ; a circumstance that is remarkable when considered in conjunction with the profusion of this shell at places within three or four miles. Mr. Sheppard also discusses the evidence of a boring at Filey, which proves the former land-level to be much higher than it is now. Recent dredging at Salt End provided similar evidence.

As Chairman of a Committee working with a grant from the Gloyne Fund (administered by the Geological Society of London), Mr. Sheppard reports progress of investigation on the Cretaceous Clays at Knapton. This important work is to be continued, and details published later.

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* Since this review was written a single valve of an undoubted *Corbicula* has been found by Mr. W. H. Crofts (see *The Naturalist*, Feb., 1928, p. 53).

This most interesting part of the *Transactions* contains also obituary notices (with portraits) of G. W. Lamplugh, F. F. Walton and J. F. Robinson. At the end are notes on excursions, 1925-26, by Mr. W. C. Ennis, and details of a boring at Hull, by Mr. T. Sheppard.

JOURNAL OF THE MANCHESTER GEOLOGICAL ASSOCIATION, VOL. I., PART 1.

Geologists will welcome the appearance of the first number of *The Journal of the Manchester Geological Association*. An introductory ' Foreword ' gives a brief account of the circumstances which led to the founding of this Association. The Manchester Geological Society, founded in 1838, on becoming more and more devoted to mining, changed its title in 1903 to the Manchester Geological and Mining Society, and in 1904 was incorporated with the Federated Institute of Mining Engineers. A project to revive former geological activities by establishing a separate section, discussed at a special meeting in December, 1924 (during the Presidency of Prof. O. T. Jones), resulted in the founding of the new Association.

It is appropriate that the first paper in this journal should be the Presidential Address of Prof. Jones, and that its subject should be ' The Foundation of the Pennines.' As he points out, what underlies the Carboniferous mantle of the Pennines is likely to remain a matter of speculation. However, by taking account of the distribution and characters of the Lower Palæozoic rocks which occur at the surface to the west and south of the Pennine Carboniferous, and by tectonic considerations, he has been able to make interesting suggestions as to the likelihood of the occurrence of such lower rocks underground in this region. Thus he opines that, while Cambrian rocks may be present under some part of the Southern Pennines, they may be limited to that part only. Similarly, he gives reasons for assuming that Ordovician rocks are not likely to be present under the area, and that Silurian rocks, if represented at all, are of limited thickness. With regard to the Old Red Sandstone, Prof. Jones thinks that this formation is absent from under the greater part of the Pennines. Thus he is led to the conclusion that, for the most part, the Carboniferous strata of the Pennines are underlain by Pre-Cambrian rocks.

Three papers on Carboniferous stratigraphy are also included in this first part of the new journal. Mr. J. Wilfrid Jackson deals with the succession below the Kinderscout

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Grit in North Derbyshire. Between this Grit and the Carboniferous Limestone, in the Edale and Castleton district, are the following beds, in descending order: Grindslow Shales, Shale Grit, Mam Tor Sandstones, and Edale Shales. Special attention is devoted to the Edale Shales, the fauna of which proves them to be equivalent in age to the Sabden Shales of Lancashire, not to the Pendlesides as was formerly supposed. Along the northern boundary of the massif they rest unconformably on Carboniferous Limestone, and range from the zone of *Eumorphoceras bisulcatum* to that of *Reticuloceras reticulatum*. The paper is illustrated by a plate and a serviceable map and sections.

The Carboniferous rocks of the Stonyhurst district are described by the Rev. G. Waddington. These beds, consisting of shales and limestones exposed on the banks of the rivers Hodder and Ribble, have been assigned to positions in various schemes of classification, from the broad divisions of Phillips and Tiddeman to the zonal divisions of Wheelton Hind and later workers. Mr. Waddington gives a detailed description of the Hodder and the Dinckley sections; he found a connecting link between the two in the occurrence of *Posidonomya becheri* and *Goniatites crenistria* at the top of the Hodder, and also at the bottom of the Dinckley sections. He has thus been able to interpret the sequence (from the Clitheroe Limestone (S) to the Pendle Top Grit) in the light of present-day criteria.

The third paper is by Mr. Arthur Bray, who describes the sequence between Lothersdale and Cowling, a district about 3 miles north-east of Colne. This paper gives detailed descriptions of beds ranging from the Main Limestone (D_3 and under) to the Lower Coal Measures. The Bowland Shales and the lower beds of the Millstone Grit are well exposed, and their zonal divisions determined; two marine bands in the upper part of this series are also described.

PROCEEDINGS OF THE YORKSHIRE GEOLOGICAL SOCIETY,
VOL. XXI., PART I.

This part, of 78 pages and 4 plates, contains six short papers on varied subjects. The first, by H. C. Versey, deals with 'Post-Carboniferous Movements in the Northumbrian Fault Block.' This Fault Block, one of the most striking morphological units in Great Britain, bounded by faults with a downthrow outwards, is saddle-shaped, having been raised irregularly in the north and south, with the lower area across Stainmoor. 'Plis de couverture' were formed in the thin skin of Carboniferous strata, as this covering accommodated itself to a shortening base during the uplift.

Although small and low, these folds can be traced by the rise and fall of any definite horizon in the Carboniferous strata. The author discusses the relation of the Whin Sill, and concludes that the beginning of the elevation of the fault block antedates the sill. He considers also the role of the block as a horst, and the formation of Permian rocks in connexion with the uplift.

Mr. W. H. Wilcockson deals with the Pre-Carboniferous Topography near Austwick and Horton-in-Ribblesdale, and shows that the Pre-Carboniferous valleys did not follow the direction of the present valleys, as has been supposed.

Glacial phenomena in the valleys of the Rivers Aire, Wharfe, Nidd, Ure, and Swale have been studied by Dr. A. Raistrick, whose paper is entitled ' Periodicity in the Glacial Retreat in West Yorkshire.' The disposition of the moraines and lake deposits (shown on a sketch map) provide evidence of six stages of retreat. Thus, in Wharfedale the successive stages, marked by terminal moraines, are seen as follows : Pool, 1 ; Burley, 2 ; Middleton, 3 ; Drebley, 4 ; Kilnsey, 5 ; Skirfare Bridge, 6.

A new genus of corals (*Auloclisia*) from the Carboniferous Limestone is described by H. P. Lewis. These corals are markedly similar to *Clisiophyllum* in their early stages, and resemble *Aulophyllum* in the later stages ; they are found in the Lower Dibunophyllum Beds of the North-west Province and the Isle of Man. The genotype is *Auloclisia mutatum*, a new species, while Prof. Garwood and Miss Goodyear's *Aulophyllum concentricum* is now recognised as belonging to the new genus. The ontogeny is described in detail and the various stages well illustrated by serial sections, reproduced on two plates. Mr. Lewis includes an interesting comparison of *Auloclisia* with *Clisiophyllum*, *Cyathoclisia* and *Aulophyllum*.

Messrs. W. Lloyd and J. V. Stephens describe the stratigraphical succession below the Kinderscout Grit in the Todmorden district. The lowest definite marine band in the area (exposed in Oakhill and Pennant Cloughs) is on the horizon of the top part of Bisat's zone E. Between this band and the Todmorden Grit about 500 feet of beds intervene. Several goniatite horizons are recognised in this succession : they are characterised by species of *Homoceras*, *Homoceratoides* and *Reticuloceras*, with *Eumorphoceras ornatum* at the top. Not all the known horizons, however, are exposed in this area. A series of shales varying in thickness from 250 to 400 feet separates the Todmorden Grit from the Kinderscout Grit. Although poorly exposed, at least two marine bands, with *Homoceras*, *Reticuloceras* and *Homoceratoides*, are observable in these shales.

One petrological paper, by A. E. Wilson and Prof. A. Gilligan, is included in this part : it deals with the basic dykes and sills of the Howgill Fells. These dykes are Pre-Carboniferous in age, and intrusive in Silurian strata of differing lithology : they form part of the system of dykes which radiate from the central intrusions of Shap. The microscopic characters are described in detail and illustrated by eight photomicrographs on two plates. The authors discuss the metamorphic effects of the intrusions and also the relationship of the dykes with those of other areas.

The concluding contribution to the part is a Bibliography of Yorkshire Geology for the year 1926, by Mr. T. Sheppard ; it contains 87 entries.—C.P.C.

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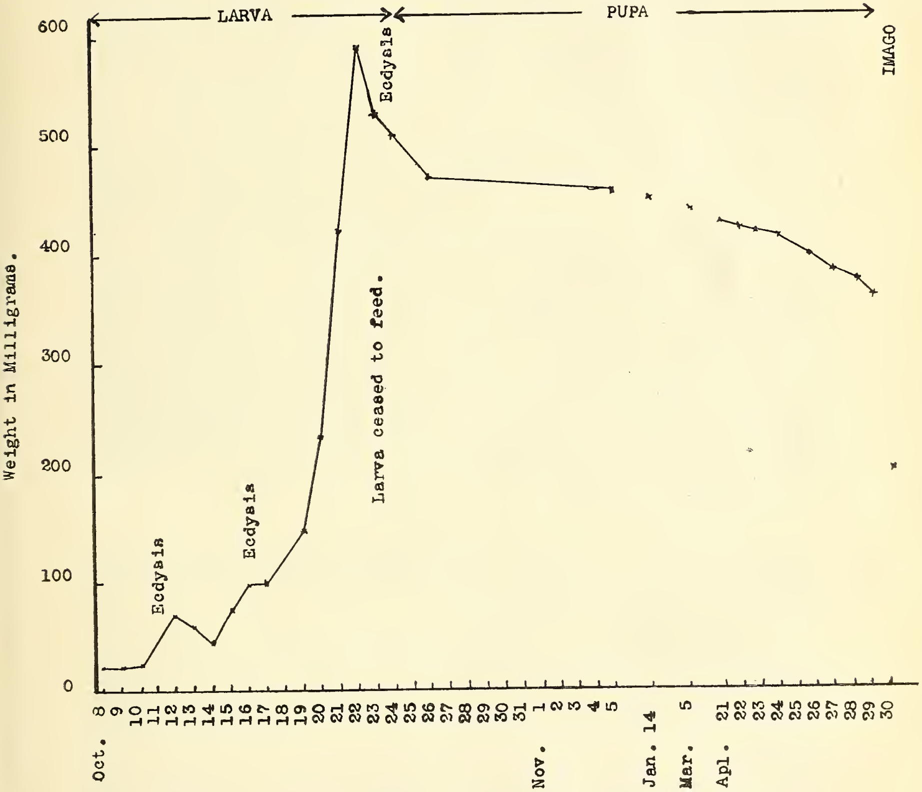
The Country between Stafford and Market Drayton, by **T. H. Whitehead, E. E. L. Dixon, R. W. Pocock, T. Robertson,** and **T. C. Cantrill.** xiii.+128 pp., 3/6. To the series of Geological memoirs on New Series Maps dealing with areas on either side of the Southern Pennines this has come as a welcome addition. Not since Hull, Selwyn, and others contributed to the geology of the area in 1850 to 1860 has any further attention been given until this new survey was commenced. It treats for the most part of an area of low relief between the Trent and Severn drainage. In the detailed description, topography, geomorphology and structure have been given a place, and the introductory chapter contains an account of the site of the old town of Stafford with relation to the geology. Such features make the memoir attractive to geologists and geographers alike. A pleasing feature is the definite attempt made to give a resumé of past observations, as far as they have been modified or confirmed by later investigation. The Carboniferous rocks are largely drift-covered in this area. The classification, for long a point of uncertainty, has been tentatively fixed by the survey so as to include the Enville Beds in the Carboniferous, as was done in the memoir on the Birmingham District. In only two doubtful localities in this district, however, do Enville rocks occur. The most noteworthy chapters are those on the Triassic rocks, which form the major part of the outcrop of the area. Notwithstanding their variability and attenuation eastwards, these rocks can be correlated with the representatives of the Trias in the East Midlands. The Pleistocene and recent deposits have been mapped in fuller detail than has been the case in the sheet to the north (Sheet 123), which is indicative of closer study and attention having been devoted to this important and interesting part of the history of the Ice Age as it affected the British area. Fluvio- and post-glacial deposits have been separately mapped and appropriately described. Economic geology, including water supply, is dealt with in a special chapter. A useful appendix, giving records of borings in the district—the value of which is greatly enhanced by the grouping of the beds—is included. A list of Survey Collection Photographs forms a second appendix. We have always found a bibliography useful, and the inclusion of one would be an advantage. Good and representative photographic illustrations are inserted in the memoir, and the superior production greatly improves its appearance. The authors are to be congratulated on their contributions to the geology of an area where exposures are neither numerous nor clear.—H.H.G.

METABOLISM OF LARVÆ AND PUPÆ OF THE LARGE CABBAGE WHITE BUTTERFLY.

H. WHITEHEAD, B.Sc.

Larvæ of the Large Cabbage White Butterfly (*Pieris brassicæ*) were very abundant in the autumn of 1925, and I made some observations of the weights of larvæ and pupæ during development.



Twelve larvæ were taken, of which six reached the imago, two died as pupæ, the remainder as larvæ—one being infected with the Braconid parasite (*Apanteles glomeratus*).

The initial weights varied from 12 to 25 mgms. In all cases the phases of growth, as shown by change of weight, were similar. There was rapid increase after each successive ecdysis, until, at a weight of 90 to 100 mgms., the insect entered its last larval instar. The rate of growth at this period was remarkable, and frequently the larva would increase its weight by five times in five or six days. Feeding would then stop, and loss of weight took place, due largely to the ejection of fæcal matter. When this period was completed the larva attached itself by a girdle and passed into the pupal condition, about five days after the maximum weight was attained. The larva usually remained attached by the girdle for about two days before shedding its skin.

Observations on the weight of pupæ were continued. Here the conditions were changed, as no feeding took place, and the observed loss in weight was due entirely to the giving off of carbon-dioxide and water vapour during respiration. This rate of loss furnishes an interesting insight into the metabolism of the insect at this period. A steady but very slight loss of weight took place throughout the winter, but this loss increased in a remarkable manner a few days previous to the appearance of the butterfly. This is no doubt due to great requirements for energy at this period of metamorphosis.

A diagram of weights of a typical insect is given. In this case the weight of the pupa on April 29th was 362 mgms. On hatching the following day it was found that the butterfly weighed 200 mgms., the pupal case 5 mgms., and extruded fluid 60 mgms., making a total of 265 mgms. After allowing for evaporation of some of the extruded fluid, this means that nearly 100 mgms. of carbon dioxide and water vapour have been produced in 24 hours, and gives some idea of the enormous energy demands made during the final stage of the metamorphosis of this insect.

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W. N. Blair writes on *Hirudo medicinalis*, the Medicinal Leech, as a British Species, in *The Proceedings of the Zoological Society of London* for January. It is shown that this leech is not extinct in this country, although it was said to be so in 1910.

The Report of the Dove Marine Laboratory, recently received, contains 'Herring Investigations,' by B. Storrow and D. Cowan; 'Pollution of the River Tyne, 1926-7,' and 'Variations in Amino-Acid Distribution in Herring Protein with Maturity,' by R. Gill; 'The Scales of the Herring,' by A. Meek; and 'Notes on Salmon Furunculosis,' by F. H. A. Clayton.

The Transactions of the British Mycological Society seem to be getting even more substantial and valuable, the latest issue on March 26th containing 150 pages, and among the many important contributions are 'The Parasitism of the Hop Leaf-spot Fungus *Cercospora cantuariensis*,' by H. Wormald; 'New British Heterobasidiæ,' by A. A. Pearson; '*Phacidiella discolor* Potebnia in England,' by F. T. Brooks; 'Successional Disease in the Scots Pine,' by Malcolm Wilson; 'Comparative Studies of *Kabatiella caulivora* and *Colletotrichum trifolii* Bain and Essary,' two fungi which cause Red Clover Anthracnose,' by Kathleen Sampson; and '*Mutinus bambusinus* Ed. Fischer and Brown Thread Blight,' by T. Petch. The papers are illustrated by excellent plates, and diagrams, etc., in the text.

YORKSHIRE MOSS RECORDS.

J. H. PAYNE.

Sphagnum acutifolium var. *robustum* Russ. Edale, 9/9/22. First record, Derbyshire. I am indebted to the late J. A. Wheldon and to Mr. D. A. Jones for kind determination, respectively, of the *Sphagnum* and *Amblystegium*, and to the latter referee also for confirmation of *Pottia starkeana*.

Tetraphis pellucida Hedw. Wood, Hoober.

Polytrichum nanum Neck. Sandal Beat, Doncaster.

Leucobryum glaucum Schp. Sherwood Forest.

Pottia intermedia Fuernr. Hoober, 3/10/20.

P· starkeana C. M. On a shovelful of Permian mud thrown into hedge bottom, Hampole, 14/3/22. First record for S.W. Yorks.

Tortula subulata Hedw. Hickleton, High Melton.

Leptobryum pyriforme Wils. Roche Abbey.

Webera carnea Schp. Brockadale.

Fontinalis antipyretica L. var. *gracile* Schp. River Rivelin, 10/9/20 ; first record, S. W. Yorks.

Brachythecium cæspitosum Dixon. Hampole.

Eurynchium rusciforme Milde. Hoober ; Ludwell Spring, High Melton.

Amblystegium juratzkanum Schp. Brodsworth.

Hypnum ochraceum Turn. Bank of River Rivelin.

No station in Don district for any of these three mosses appears in Lee's *Flora of West Riding*.

The above three fresh records are brought into the second edition, 1926, of the *Census Catalogue of British Mosses*.

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Deformed Mollusca.—Following my paper on 'Some Rare Forms of Mollusca,' which appeared in *The Naturalist* for April (page 103-5), I am sending two further examples to be placed with the specimens there figured. One is a *Clausilia plicatula* with two mouths. In other words it is an example of distomatism, similar to that figured and described in Mr. J. W. Taylor's Monograph, Vol. I., page 119, though in that case the species was *Clausilia bidentata*. In the specimen sent herewith the new aperture is only partially completed. This, as Mr. Taylor suggests, is probably due to accidental blocking of the original aperture by a piece of sand or other substance, thus compelling the snail to break a way through the outer wall and form a new aperture, or perish. The second example is of the common mussel (*Mytilus edulis*), and is similar to that which has been described by Mr. Taylor as polyperistomatism, a similar monstrosity being figured in his Monograph, Vol. I., page 120, though in that case the species was *Unio tumidus*.—Hans Schlesch, Copenhagen.

THE YORKSHIRE NATURALISTS' UNION'S ANNUAL REPORT

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(*Continued from page 125*).

Hemiptera (J. M. Brown, B.Sc.) :—There is very little of special interest that can be reported yet concerning this year's work amongst the Hemiptera. The season has been poor on the whole, and the insects were very late in making any appearance, even during the fine Whit-week they were not much in evidence. So far as I know at present, one species only can be added to the County list ; *Heterocordylus genistæ* taken at Ingleton, but several of the less well-known species have turned up, such as *Cydnus claviculus*, *Monanthia ampliata* and *Calocoris ochromelas* at Allerthorpe, and *Acanthosoma hæmorrhoidalis*, *Ploariola vagabunda*, *Microphysa elegantula* and *Gerris odontogaster* near Sheffield. A considerable number of species were collected at Sedbergh, a list of these appearing in the report of the excursion.

Psocoptera (J. M. Brown, B.Sc.) :—A start has been made in working out the species of this group to be found in the county. No previous work seems to have been done with these insects in Yorkshire, and so far about sixteen species have been taken. I should be glad to see any material or to have any records, as a list is now being prepared for *The Naturalist*.

Diptera (Chris A. Cheetham) :—Interest continues to be shown in this group ; this is evident from the pages of *The Naturalist*. Mr. W. D. Hincks publishes a list of additions to the Yorkshire Midges, and Dr. W. J. Fordham continues to add to his list of Diptera from Allerthorpe Common, many of these belong to the Tachinid family. The reports of the Union's excursions show that the two-winged flies have not been neglected on these occasions.

Lack of sunshine during the year has been followed by a scarcity of the groups of sun lovers like the Hoverflies, but groups with aquatic larvæ, especially Culicidæ and Limnobidæ have been very abundant ; this in the case of the Common Gnat (*Culex pipiens*) is reported on pp. 301-302 of our magazine. Mr. J. F. Musham, writing from Ulverston on September 16th, says, May I mention an interesting phenomenon observed here for the last three evenings, that is the large flights of midges ascending into the air like wisps of smoke to a great height, and visible a long way owing to their density. There were many columns of them rising from Flass Wood, like a lot of cottage chimneys smoking.

Species of Tipula, whose larvæ live in wet places, like *luna*, *luteipennis*, *melanoceras*, and *diana* (*Prionocera turcica*) have appeared in usual quantity. *Oleracea* and *paludosa* were scarce in the early months as last year. May this be due to the open winter making it possible for the birds to get at the larvæ for a longer time? They were more plentiful in August and September. Others like *unca*, *scripta* and *varipennis* were much less abundant than normally, and many species of Pachyrrhina were never seen in places where they are generally plentiful.

The visit of Mr. F. W. Edwards provided numerous additional records for our list, and the result of the year's work will prove very satisfactory.

The discovery of *Microdon mutabilis* at Austwick extends the range of this interesting species from Grass Woods, and a Limnobid from Austwick, *Dicranomyia aperta* Lündst., is an addition to the British list.

G. C. Johnson's report on economic biology, entitled 'Insect Pests in Yorkshire Gardens,' appears in *The Naturalist* for February, pp. 51-53.

Arachnida Committee (W. Falconer, F.E.S.) :—The work done by members of the Arachnida Committee at the various meetings held during the year is given in detail in the general accounts published in *The Naturalist*, Grassington, July, p. 214 ; Allerthorpe Common, November, pp. 334-335 ; and Sedbergh, December, p. 362, and the rarer species and additions to the fauna of the different localities particularised. To the first named area *Zelotes apricorum* L. Koch, an adult female, must be added from the Bastow Wood. Following the Allerthorpe meeting, the writer spent a week in the vicinity of Rillington, in the north-west of V.C. 61, and was successful, not only in extending the stations for the species obtained there in 1906, and later included in the 'Spiders of Yorkshire,' but also in adding a number of others not before noticed there. Two of the latter are new to V.C. 61, and are distinguished below by an asterisk. Included amongst them was a gynandrous example of *Œdothorax retusus* Westr., interesting because of the rarity of non-functional hermaphroditism in spiders, and because a similar specimen of the same species was taken some years ago by the writer near Southport.

Mr. T. Sheppard submitted many examples of a mite, *Bryobia pretiosa* Koch, which had, as it sometimes does in the fall of the year, swarmed into a house at Hull, causing considerable disquiet in the minds of the inmates.

SPIDERS.

New to Rillington District.

***Theridion vittatum** C. L. K. ♀s.
Entelecara erythropus Westr. ♂
Troxochrus scabriculus Westr. ♀s.
Cnephalocotes obscurus Bl. Both sexes.
Coryphæus distinctus Sim. ♀.
Agyneta conigera Cb. ♀
* ,, *cauta* Cb. ♀
Micryphantes saxatilis Bl. ♀s
Tmeticus graminicola Sund. ♀
Linyphia pusilla Sund. ♀
Tetragnatha solandrii Scop. Both Sexes.
Pachygnatha clerckii Sund. ♀s
Clubiona diversa Cb. ♀s
,, *terrestris* Westr. ♂
Agrœca proxima Cb. ♀s
Micaria pulicaria Sund. ♀s
Lycosa amentata Clerck. Females of the form described as *L. postuma* Cb., in which the lower part of the epigynal plate is concealed beneath a fold of the skin, giving it an unusual appearance.

HARVESTMEN.

Lacinius ephippiatus C. L. K. ♀s

BOTANICAL SECTION.

Botanical Survey Committee (Chris. A. Cheetham) :—We little thought as J. Fraser Robinson read his report to us last year that it was for the last time, and that the kindly voice would be silent ere we met again. For many years we have been indebted to his pen for our annual report, but now the time has come when less capable hands must try to fill the gap he has left.

Again there has been a hearty response to the request for information, and the exceptional weather behoves us to consider its effect on the vegetation carefully. The main features were an open winter with nice weather in early March, which brought the spring flowers along in good

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time ; as was the case last year this open winter proved harmful to the alpines, the Purple Saxifrage plants at the lowest elevations being badly damaged by the alternate wet and frost by day and night. This plant was in flower on Moughton Scar on March 25th, and was over even on the highest parts of Pennyghent on April 30th.

Easter was fine and warm, but the following weeks were cool, with frost at nights, this being the time when the fruit trees were in bloom and causing damage to the blossom. About the 6th to 9th of May there was a burst of exceptional heat which brought out the leaves on the Oak and Ash, and some flowers on the Hawthorns in the lower parts of Airedale. May blossom is very often June blossom with us, and this early date is again similar to last year. The spring might be said to have been on the whole favourable to begetation in early June, however, there were many frosty nights. The rest of the year has been cool and showery, with a few warm days in mid-June, mid-July and the first week of August.

The effect on the fruiting of the trees and shrubs has varied considerably in different districts, but on the whole it appears to have been an average season, certainly the Ash has made up the leeway of last year, and the Raspberries have had an extended fruiting period and done exceptionally well. The Currants and Gooseberries have also had good crops, and if the sunshine of early October continues there will be plenty of Blackberries. Mr. Wattam (Huddersfield) reports abundant fruit on the Cloudberry, and he and Mr. Frankland (Cowling) agree that the Bilberry and Black Crowberry crops were good. Mr. A. Wilson (Carnarvonshire) finds Bilberry poor at low level, but fairly good on the mountains.

Plums have been poor, so have the Sloes, though these had some fruit, whereas last year it was a complete failure. Pears and Apples are very patchy, many very poor, others with heavy crops. Mr. G. C. Johnson writes : The Apple crop through the Ridings was very patchy and well under average crop ; the Bramley Seedling, by most considered a strong growing and very hardy variety, appears to have suffered from frost more than any other. On the other hand, Mr. Whiteway, of Exeter, states in his annual report that this variety and some others have produced fruits of exceptional size, and that trees have had to be propped to bear the weight. He states that the Apple crop of England will be 10 to 20 per cent. better than last year. Hazel nuts are reported moderate to good, but where this occurs in quantity, as in Craven, there is certainly a good crop. The reports on Elder vary. Mr. Flintoff (Goathland) says poor, though flowers were good ; other observers say very good, and Mr. Wilson adds ' Do these ever fail ? ' Mr. Beanland draws attention to the second flowering of this tree. On some of the Hawthorns there is very little fruit, others are crimson over, and in some districts it is a decidedly good crop.

The good crops are Ash, Raspberry, Loganberry, Hazel, Currants, Gooseberry, Guelder Rose, Mountain Ash, and Broom. The poor crops Beech, Horse Chestnut, Plums and Sloes. The group which are variable are Oak, Elm, Sycamore, Hawthorn, Apple and Pear, and as most of these seem to have flowered well, it is evident that the question of shelter and the element of luck in missing or not the occasional frosty nights at the critical time will provide the answer to the riddle.

The other interesting feature of the year is cited by Mr. Wilson : During June vegetation made but slow progress owing to the gloomy weather, but in July, August and September the moderate warmth and excessive dampness caused a very abnormal vegetative growth. This was noticeable in all plants, but was specially evident in the long shoots made by trees and shrubs, and in the rank abundance of garden and agricultural weeds. Mr. Beanland says secondary growth, which I always look out for in July, was well to the fore in Oak, Hawthorn, Sycamore, Elm, Lime and Ash. Now (September 29th) in places where trees exposed to the late rough winds have lost all their spring growth the secondary growth leaves persist and exhibit the length of growth beautifully. Some Hawthorns in Hawkesworth Falley have a secondary growth 10 in. long, but that is an extreme case, the average growth of Oak, Elm, etc., will be no more than 4⅓ in. to 5 in. Mr. Wattam states this growth on the Oak varies from 6 in. to 12 in. in the main axis, with new lateral branches 4 in. to 8 in. Mr. Flintoff would restrict the term to a growth following complete destruction of the primary growth by frost, and finds there has been considerable growth of this type on Ash, Oak and Beech. Mr. H. Dibb (Shipley) sends a list, and marks Oak, Hawthorn, Alder, Elder, and Elm as most frequent, and Birch, Horse Chestnut, Hazel, Sycamore, Beech, Ash, Mountain Ash, Lime, Willow and Poplar occasionally.

I noted the most evident effect on the Oak in the York-Pocklington-Skipwith area; it is less evident in the hilly country near Settle. I saw the growth on the Oak practically the whole way from Leeds to London by both L.M.S. and L. & N.E. routes. The Plane trees in the London squares show this growth, and also many garden shrubs like the Laburnum and Rhododendron. Mr. Musham (Ulverston) notes it in the Oak, especially on the stunted plants amongst the undergrowth, and he mentions an autumn crop of Rhubarb, which he thinks due to the wet summer. Mr. Beanland states that catkins of Birch, Alder and Hazel have grown for next season very prominently.

The outstanding feature of work amongst the flowering plants has been the discovery of *Arnoseris minima* Schw. and Koerte at Allerthorpe Common in the East Riding by Mr. F. A. Mason. How this would have cheered our old friend had he been spared. Mr. Butcher stated that *Tillæa aquatica* at Adel lower dam has increased very much since he first discovered it there. Mr. W. K. Mattinson reports that the Spiked Veronica on Moughton made a very fine show this year.

Botanical papers have appeared in *The Naturalist* from Miss Johnson on ' A Form Variation in *Ranunculus ficaria*,' Mr. G. Erdtman on ' The Peat Deposits of Cleveland,' and Mr. A. Malins Smith on ' New Yorkshire Algæ,' and the reports of the Section's activities at the field meetings of the Union which have appeared in our journal show that Yorkshire botany is still a lively fact.

(To be continued).

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Mr. Riley Fortune, in an address to the Harrogate Rotary Club recently, appealed to the Harrogate Corporation to make a bird sanctuary at Harlow Moor.

The annual meeting of the Halifax Scientific Society was held recently, Mr. H. Waterworth presiding. Mr. J. H. Lumb, the Secretary, in the fifty-fourth report, mentioned that the membership was 182, a loss of two on the year. The membership of the natural history section was given as 19, circle of microscopy 14, photographic section 74, and the report concluded that ' in spite of the many counter-attractions in the town the Society still maintains its prestige as the centre for the discussion of the latest scientific thought and activity.' The reports having been adopted, the following officers were elected: President, Mr. H. Waterworth; Vice-Presidents, Mrs. Barker, Mrs. Sismey, Mr. F. Barker, Mr. J. H. Bolton, Mr. C. Fielding, Miss Topham, Mr. R. W. Harris, Mr. H. P. Kendall, Mr. C. J. Spencer, Mr. S. Tidswell, Mr. J. A. Wade and Mr. J. Halliday. An exhibition of lantern slides followed, the sets being by Messrs. W. Scruton, Leeds; F. Martin Duncan, London; and W. McClelland Bottomley, former President of the photographic section.

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A BIOLOGICAL FLORA OF BRITAIN.

The British Ecological Society recently decided to undertake the publication of a ' Biological Flora of Britain,' to be edited by Dr. E. J. Salisbury, President of the Society. The following scheme has been approved, and anyone willing to assist is invited to communicate with Dr. Salisbury, Botany Department, University College, Gower Street, London, W.C.1. It is felt that many botanists in the north of England, and in Yorkshire in particular, would be glad to co-operate in the work, and supply such details as they could relating to species with which they are acquainted.

PROPOSED SCHEME FOR BIOLOGICAL FLORA OF BRITAIN PREPARED BY E. J. SALISBURY.

A. Species and Synonomy. (*a*) Varieties and ecads.
B. Distribition and Altitudinal range.
C. Fossil and sub-fossil record.
D. Soils. (*d*) Type. (*d*') Water content. (*d*'') Reaction. (*d*''') Carbonate content. (*d*'''') Organic content.
E. Climatic conditions. (*e*) Rainfall range. (*e*') Light demands.
F. Communities and status. (Characteristic, constancy, etc.)
G. Biological type. (*g*) Perennial, biennial, winter or summer annual.
    (*g*') Mode of perennation.
    (*g*'') Assimilation type : evergreen, summergreen, prevernal, etc.
H. Phenology. (*h*) 1st leaf. (*h*') 1st flower. (*h*'') Seed ripens. (*h*''') Leaf fall.
I. Root system. (*i*) Type. (*i*') Volume occupied. (*i*'') Average rooting depth.
    (*i*''') Special features, *e.g.*, adventitous shoots, distribution of root hairs, root-nodules, etc.
    (*i*'''') In the case of geophytes, the depth of the rhizome or bulb, etc. (contractile roots, etc.).
J. Shoot system.
    (*j*) Average height of the vegetative organs.
    (*j*') Leaf positions.
    (*j*'') Hydathodes or extrafloral nectaries.
    (*j*''') Morphological transpiration checks or other features affecting transpiration.
    (*j*'''') Special anatomical features (Ærenchyma, any special features of the chlorenchyma).
K. Reproduction (sexual and asexual).
    (*k*) Fertility ; whether self or cross-pollinated, whether self-sterile or self-fertile, or apogamous.
    (*k*') Pollinating mechanism. Type of pollinating agent. (If entomophilous, the type only of pollinating insect, unless specially restricted to particular species.)
    (*k*'') Any special features regarding fertilisation (*e.g.*, chalazogamy ; cleistogamy).
    (*k*''') Seed output of normal plant. (In the case of trees, frequency of mast year).
    (*k*'''') Size and weight of seed.
    (*k*''''') Means of seed dispersal (or fruit dispersal).
    (*k*'''''') Percentage germination. Duration of viability.
    (*k*''''''') Period of germination in nature.

L. Reproduction (Vegetative).
  (*l*) Means of vegetative propagation.
  (*l′*) Rate of vegetative spread.
M. Physiological features (*e.g.*, sleep movement or other special responses as movements of flower and fruit stalks).
  Osmotic pressure or suction force when known, and observed range.
  Special modes of nutrition. (Mycorrhiza.)
N. Parasites. (Only when of especial interest, or very common, or where confined to a particular species and of general interest.)
  Susceptibility to destruction (*i.e.*, Hardiness, fires, animals, etc.).

——: o :——

YORKSHIRE BRYOLOGISTS AT SLAITHWAITE.

F. E. MILSOM, B.Sc.

A small party of bryologists spent a very pleasant day on November 27th in exploring Drop Clough and Scout Wood, near Slaithwaite, in the southern Pennines. Though nothing of outstanding rarity was discovered, it was good to see the familiar plant associations. *Orthodontium gracile* var. *heterocarpum* grew in great quantity at the top of Scout Wood ; one has learnt now to expect this moss in south-west Yorkshire expeditions. Of the hepatics, *Lophozia muelleri* was unusual on non-calcareous soil.

The thanks of all the party are due to Mr. and Miss Grainger for their careful planning of the route, and for the excellent meal for which they had arranged.

Mosses.

Sphagnum fimbriatum.
S. plumulosum.
S. *recurvum* var. *mucronatum.*
S. *inundatum.*
Tetraphis pellucida.
Polytrichum aloides.
Catharinea crispa.
Dicranella heteromalla.
D. cerviculata.
Philonotis fontana.
Orthodontium gracile var. *heterocarpum.*
Hyocomium flagellare.
Eurynchium rusciforme.
Plagiothecium elegans.
P. sylvaticum.
Hypnum commutatum.
H. ochraceum.

Hepatics.

Alicularia compressa.
Lophozia muelleri.
L. flœrkii.
Calypogeia trichomanis.
Cephalozia connivens.
Lepidozia trichoclados.

——: o :——

Mr. H. E. Forest refers to ' The Hare in the Isle of Man ' (as well as to other animals, recent and fossil) in *The Irish Naturalists' Journal* for March.

H. A. Baylis gives a list of ' Records of Some Parasitic Worms from British Vertebrates,' in *The Annals and Magazine of Natural History* for March. In the same publication for February, Oldfield Thomas describes ' A Special Proodont Race of Water-vole occurring in Northumbria,' and R. S. Bagnall describes ' *Mymarothrips ritchianus*, a new type of Thysanopteron,' and W. H. Leigh-Sharpe refers to ' The British Tomopteridæ.' In the January issue, Stanley Smith describes *Nemistium edmondsi* gen. et sp. n., a new Carboniferous Coral from Cumberland.

1928 May 1

In Memoriam.

C. G. DANFORD.

We regret to record the death of Mr. C. G. Danford, which occurred in Northern France early in March. Yorkshire naturalists will remember him when he occupied Reighton Hall, on Flamborough Headland, and was successful in making such wonderful investigations among the fauna of the Speeton Clays, the results of his fine work being published in *The Proceedings of the Yorkshire Geological Society, the Transactions of the Hull Geological Society,* and in *The Naturalist.* Many species of ammonites and belemnites were obtained by him which were new to science, and the Hull Museum, and Museum of Practical Geology at Jermyn Street, have considerably benefited as a result of his researches at Speeton. Subsequently he removed to Folkestone, where his love of collecting resulted in a wonderful series of Ammonites and other species from the Gault being secured, which he also sent on to Hull.

He took a keen interest in collecting specimens relating to Prehistoric Man, and when the present writer visited him in the north of France a few years ago, he was shown over many favourite collecting sites for Neolithic remains.

Mr. Danford was a keen naturalist and sportsman, and a great traveller. At one time interested in vineyards in Hungary, he collected a wealth of folklore and other information relating to Central Europe which made a conversation with him particularly instructive and interesting. For the British Museum he collected small mammalia, many of which have been described as new species, and duplicates were given to the Museum at Hull. The latter, also, at the present time has as one of its chief exhibits in the Natural History Section, a magnificent case of Chamois, almost records for their size and length of horn, which were shot and presented by Mr. Danford.

In him East Yorkshire geologists have lost a sincere friend. For some little time Mr. Danford has been very much depressed on account of the death of his wife, which occurred early in the New Year, and he leaves one son and one daughter, to whom out sympathies are extended.—T. Sheppard.

——:o:——

Birds at the Nest, by **Douglas Dewar.** London: John Lane, The Bodley Head, 271 pp., 7/6 net. Mr. Dewar has made a special study of the interesting period in the life of the bird when the making the nest and the rearing of the young takes place. The volume is in two parts, the first devoted to The Parent, and contains eleven chapters dealing with The Mind of the Nesting Bird; Building the Nest; Incubation; Strange Eggs in the Nest; Parental Affection; The Strength of the Parental Instinct; Feeding the Young; Profiting by Experience; The Cleverness of Birds; The Broken Wing Trick; The Cuckoo. The second part deals with The Nestling, its Education, Fear, and Song.

FIELD NOTES.

Frogs as Food of Foxes.—In text-books on zoology frogs are included in the very varied food of the fox ; but to what extent I have never had an opportunity of learning. By a recent incident I am inclined to believe that frogs form much more than a casual, or makeshift, item in the dieting of foxes. On the afternoon of March 4th I had occasion to pass the small lake on the golf links of the Ben Rhydding Hydro Hotel. On this lake the frogs and tadpoles are always at the east end, while at a similar tarn near by they are invariably at the west end. This fact has puzzled me for nearly twenty years, as I was unable to see any real difference—with the single exception that the water on the small tarn is just slightly deeper at the east end. On this particular afternoon the frogs were extremely lively. There was only a small quantity of spawn, although there were several hundred frogs ; and as their object appeared to be ceaselessly chasing one another, there was more commotion on the surface of the water than I ever remember having seen before, under similar circumstances. This was continuously accompanied by the drone, or ' community singing,' which to me seems exactly like the noise of a motor bicycle in the remote distance. No individual note or voice is heard, but I believe it is performed by about 50 per cent. of the numbers present, who have their mouths slightly open, and with the appearance of a little froth about their mouths. Probably they are males, but I have never ascertained for certain, as on any attempt to secure one it immediately closes its mouth and dives. After watching their antics for about a quarter of an hour, I was joined by three youths. We stood close to the edge of the water, and only a very few of the frogs that were the nearest to us (and these few sank to the bottom) took the slightest notice of our movements. In their chasings they appeared to be blind to everything else, and often when one was touched with a stick, it did not always stop its career. One of the youths had a dog with him—an Irish terrier—which up to now had not put in an appearance at the lake side. It now just trotted round the top of the bank of the lake, on the horizon, as it were, but at the least three times the distance from the water than we were standing, and moving. The effect on the frogs was extraordinary and marvellous. Every one instantaneously disappeared to the bottom, as if they had an electric shock. Not one returned for quite five minutes. During the next five minutes a few stragglers cautiously put their noses out in order to survey the situation. They were not giddy frogs now, but were very seriously minded. I could only attribute this remarkable occurrence to the frogs mistaking the dog (which was a red one) for a fox. If the sight of a fox can strike such terror into the hearts of the whole of a large community of amorous and excited frogs, then, in my opinion, the fox is a much greater enemy to frogs than is generally supposed. What appeared to confirm my surmise was that a small portion of the frogs, owing partly to the contour of the lake, and partly by the obstruction of an island, had not seen the dog, and still continued to behave in the same excitable manner. To-day (March 11th) the countryside is covered thickly with snow. I passed by the same lake, and not a frog was to be seen. No doubt they have made for the bottom of the deeper parts of the lake, as far from the snow as possible.—H. B. Booth, Ben Rhydding.

Red Deer Antler in Lincolnshire Peat.—A large tine of an antler of a Red Deer, with the point highly polished (as often happens), has been found in the bed of Peat at Barrow Haven, North Lincs., at a depth of 5 feet from the surface, by Mr. A. F. Ward. I understand that with it were found many other bones, including portions of jaws and teeth ; and some fragments of pottery. I have not seen the latter, but quite a considerable number of fragments of Roman pottery have been found in this district in association with red deer, ox and other remains, and doubtless this is similar.—T. Sheppard.

——:o:——

'The Buoyancy of Whales,' by R. W. Gray, is the title of an interesting note in *Nature*, No. 3046.

A portrait and obituary notice of John Henry Durrant appears in *The Entomologist's Record* for March.

The North Western Naturalist for March contains many valuable papers and notes dealing with its area, and other papers and notes.

The principal items in *British Birds* for March are 'Ornithological Report from Norfolk for 1927,' by B. B. Rivere ; and 'Birds Observed in the North Sea, 1927,' by David K. W. Murray.

British Birds for April includes notes on 'The Irruption of the Crossbill,' 'White Lapwing in Cheshire,' and 'The Food of Certain Birds,' by C. Elton, among many other items.

A report of the British Ecological Society's excursion to Pickering appears in *The Journal of Ecology* for February. In this, Dr. Woodhead, Mr. Burnley, Mr. Flintoff and others are thanked for their help.

In *The Journal of the Ministry of Agriculture* for March is a paper on 'The Downy Mildew of the Hop in 1927,' by Professor E. S. Salmon and W. M. Ware ; and, for April, 'The "Mat" in Grassland,' by John Orr.

W. E. China describes *Corixa dentipes* Thoms. in Lincolnshire, an addition to the list of British Heteroptera ; and G. T. Lyle *Apanteles brevicornis* Wastmael : a Braconid new to Britain, in *The Entomologist's Monthly Magazine* for April.

The Durham University Journal for March contains a paper on 'The Foundations of Durham Castle and the Geology of the Wear Gorge,' by Arthur Holmes ; and 'Excavations on Hadrian's Wall,' by F. Gerald Simpson, both of which are well illustrated.

REVIEWS AND BOOK NOTICES.

Notes on Some Birds of Dar es Salaam, by **Cecily J. Ruggles-Brise.** London : Jarrold & Sons, xvii. + 96 pp., 4/6 net. This describes the commoner species to be met with in Dar es Salaam Province, and is illustrated by some pen and ink sketches made by Gerard H. Gurney, and a few photographs. The chapters deal with Passeres or Perching Birds ; Picariæ ; Parrots, Raptorial Birds, and Doves ; On the Shore at Dar es Salaam ; Game Birds, a Tame Gull ; and Migrants. We are giving the description of two species as a sample, though in other cases the accounts are much more lengthy : 'Family : Turdidæ. *Turdus gurneyi*. A small, reddish-brown thrush to be found in the Uluguru Mountains above Morogoro.' 'Family : Crateropodin . Genus : *Crateropus* (Babblers). Noisy, gregarious birds, the size of blackbirds. *G. melanops* is common at Magadu, and one hears them loudly chattering in the bush some way off.'

The Geology of the Rossendale Anticline, by **W. B. Wright, R. L. Sherlock, D. A. Wray, W. Lloyd** and **L. H. Tonks.** xiv. + 182 pp., 4/6 ; London : H.M. Stationery Office. This memoir describes the geology of the high ground of East Lancashire lying between the towns of Blackburn, Burnley, Todmorden, Rochdale, Bury and Bolton. The sandstones and other rocks of the Millstone Grit Series and Coal Measures are referred to with greater precision than formerly. This has been brought about largely by the extensive use of the goniatite zonal-scheme, instituted by Mr. W. S. Bisat after careful researches upon this group of fossil cephalopods. Mr. W. B. Wright contributes an interesting chapter on the new evidence afforded by these fossils and their evolution. The Vale of Todmorden, famed since 1841 for its fossil molluscan remains, comes in for much critical revision at the hands of Messrs. D. A. Wray and W. Lloyd. In the chapter on general stratigraphy by all the authors there are many items of interest, including the rhythmic character of the sedimentation in the Millstone Grits and Lower Coal Measures, admirably shown by diagram (fig. 4), and the south-westward thickening of the Higher Grits and the base of the Coal Measures, noted previously by Messrs. L. H. Tonks and W. B. Wright in the Summary of Progress for 1923. The chapter on the glacial geology is based upon the comprehensive work of Dr. Jowett in 1914. The memoir, which is illustrated by several excellent photographs and very useful diagrams, reflects great credit upon all the officers concerned in its preparation.—J.W.J.

Gifttiere und ihre Giftigkeit, von **Dr. E. N. Pawlowsky** (Professor of Zoology in Leningrad). Jena : Verlag von Gustav Fischer, xvi. + 516 pp., 176 illustrations (some partly coloured). Mk. 27 (in paper covers), Mk. 29 (bound). This is a far-reaching account of 'Poisonous Animals and their Poisonousness,' and is remarkably comprehensive and interesting. It treats not only upon animals poisonous to man, but describes also those which in the struggle for existence make any use whatever of poisonous substances. Some idea of the work may be gathered from the author's arrangement of his subject. He classifies the animals concerned according to the nature of the poisons, whether they have relation to some special structural feature, or whether to some peculiarity of chemical constitution of the animal tissues. In the first group he includes Infusoria and Cœlenterates with stinging threads ; caterpillars with urticating hairs ; scorpions, fishes and Duck-billed Platypus with poison spines ; Hymenoptera with ovipositor stings ; lizards and snakes with poison fangs ; spiders, myriapoda, lice, bugs, diptera, etc., with poisonous mouth parts ; Amphibia with poison glands ; millepedes with stink glands ; Molluscs with sulphuric acid secreting salivary glands ; and such peculiar cases as the Oil, Bloody-nosed and Bombardier beetles. The account of spiders is exceptionally full and valuable, extending through twenty-six pages, and the same fullness of treatment is seen in other groups of Arachnida, Myriapoda and Insects ; and, above all, in the snakes. The work is well got up in the manner we are familiar with in the publications of the house of Gustav Fischer. An English translation of such a work is to be desired.—T.St.

—: o :—

NORTHERN NEWS.

Sir Aubrey Strahan, K.B.E., F.R.S., late Director of the Geological Survey, has died at the age of seventy-five.

Sir Thomas Holland has been nominated as President of the British Association for 1929 at the South African Meeting.

Among the new Fellows of the Royal Society are the names of Dr. J. W. H. Harrison, lecturer on Zoology at the University College, Newcastle, and Dr. F. L. Kitchin, Palæontologist to H.M. Geological Survey.

According to *Nature*, the new Science Museum at South Kensington, opened by the King on March 20th, has only £800 per annum for the purchase of specimens. This is much smaller than the amount allotted to several comparatively small provincial museums, which also receive grants in aid of the purchase of specimens on the recommendation of the Director of the Science Museum !

The Yorkshire Post informs us that the Northumberland Angling Federation recently liberated 830 yearling trout from the Tyne and Eden trout hatcheries at Armathwaite, Cumberland, in the Tyne at Wylam ; and the Tyne Salmon Conservancy Board have liberated 2,250 yearling trout in the Tyne between Wylam and Haltwhistle, the North Tyne, and the Rivers Derwent and Rede.

We learn from *The Daily Chronicle* for April 12th that 'two missel-thrushes have confounded Selby naturalists by building and nesting on the brake of a goods wagon standing in a siding at the junction of the Selby-Leeds main line and the Goole line. Usually shy birds, which nest in secret places, it is surprising they should choose this spot where noisy trains pass every few minutes.'

A contemporary describes ' one of the most interesting antiquarian discoveries in East Lancashire ' [a flint adze]. ' It is probably the most beautiful specimen ever found in either East Lancashire or West Yorkshire.' It was found by Mr. Chew, of Bacup. Judging by the illustration, Lancashire and West Yorkshire must be very badly off for stone implements if the above account is reliable.

Two useful memoirs have recently been issued by the Ministry of Agriculture and Fisheries in their Fishery Investigation Series. The first is entitled *The Natural History of the Hake*, Parts I. and II., by C. F. Hickling (100 pp.), and the second is a *Report on English Plaice Investigations during* 1924 *and* 1925 (77 pp.), by D. E. Thursby-Pelham. Each is obtainable from the H.M. Stationery Office, Adastral House, Kingsway, W.C.2, at 7/6. The subjects are dealt with under various heads, scientific and economic, and illustrated by a wealth of diagram and statistics which we expect to see in publications from this ministry.

We have received a further circular in reference to the international meeting of geologists in Copenhagen in June, from which we gather that : ' The International Meeting of Geologists in Copenhagen will be held from Monday, June 25th, to Thursday, June 28th, 1928. These days will be taken up by lectures and discussions on the geology of Denmark, and visits to the Mineralogical-Geological Museum, the Zoological Museum, the Palæontological section of which contains the celebrated P. V. Lund Collection of Brazilian Edentata, the Archæological Museum, and other collections and sights in Copenhagen. During the meeting an excursion will be made to the esker Strö Bjerge, to the kitchen middens of Bilidt and Havelse, and the terminal moraine of Hornbæk near Helsingör. Dolmens and a passage-grave will be visited on the way.'

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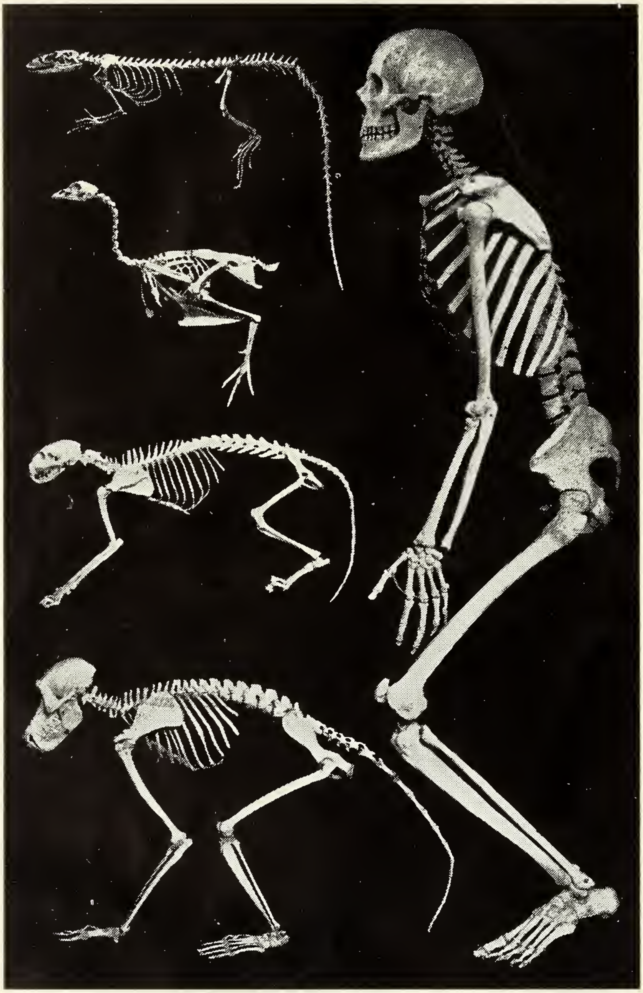

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That all five skeletons are essentially alike is the opinion which is formed even in a casual glance. It is reasonable to think that beings whose structure is so very similar must be of common descent.

NOTES AND COMMENTS.

EVOLUTION OF ANIMALS.*

The London County Council continues to publish its remarkably cheap and attractive monographs relating to the various spheres of activity in connection with the Horniman Museum and Library. We have just received one which deals with the Evolution of Animals, and is a handbook to the cases illustrating that subject ; the frontispiece to which we are kindly permitted to reproduce (Plate III.). The pamphlet has been written by Mr. H. N. Milligan, and has been edited by the Curator, Dr. H. S. Harrison. The subject is dealt with under twelve headings, as follows :—Part I. The Evidences of Evolution : from Classification, Structure, Embryology, Fossils, Domesticated Animals ; and Part II. Theories of Evolution : Lamarck, Darwin, Mutation and Mendel. There is also an Appendix on ' Hints for Further Study.'

ANTS.

These animals seem to be receiving particular attention from students in different parts of the world, but probably the two volumes by Auguste Forel, which have been so admirably translated by C. K. Ogden, may be looked upon as the high-water-mark of works on this subject.† There are in all over 1000 pages of wonderful descriptions and stories of various species of ants in different parts of the world, illustrated by coloured and other plates. The coloured illustrations especially are made additionally attractive by having letterpress printed on a transparent sheet covering the objects figured. All sorts of quaint attitudes are taken up by different species, but we think the illustration of *Formica pratensis* ejecting poison at an approaching man is one of the most amazing we have seen for some time.

THE ANT PEOPLE.‡

Here again the translator has given an admirable rendering of a work, originally appearing in German, and while this is not so pretentious as the preceding, it is no less interesting to the general reader. The following heads of the chapters give an idea of the nature of the method of description :—The Wedding of the Ants ; Some Characteristics of Ants ; How Ants Live and Work ; The Hunters ; The Agricultural Ants ; Artisan Ants ; Growing Food ; The Cattle-keeping

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* The Horniman Museum, Forest Hill, London, S.E.23., 71 pp., 6d.

† ' The Social World of the Ants,' by Auguste Forel. London : G. P. Putnam's Sons, 2 vols., £3 3s.

‡ By Hans Heinz Ewers. Translated from the German by Clifton Harby Levy. London : John Lane, The Bodley Head, Ltd., x.+323 pp., 8/6 net.

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Ants ; Stranger Guests in the Ant State ; Ants and Termites ; Living Together ; Masters and Slaves ; The Amazons ; Exceptional Slave States ; The Soul of the Ant ; and An Appendix on Ant Names. As the translator points out : ' Many of our preconceived ideas about Ants are exploded by Dr. Ewers. We find that the Ants are not all as industrious as we have been taught to believe. We learn that among the Ants are many species that never work, others that live by theft, and still others who live like the robber barons of the Middle Ages. In a word, we may now learn all that the layman needs to know about Ants, and how to live, love, work, or loaf, just like some other Peoples.'

CERATIAS.

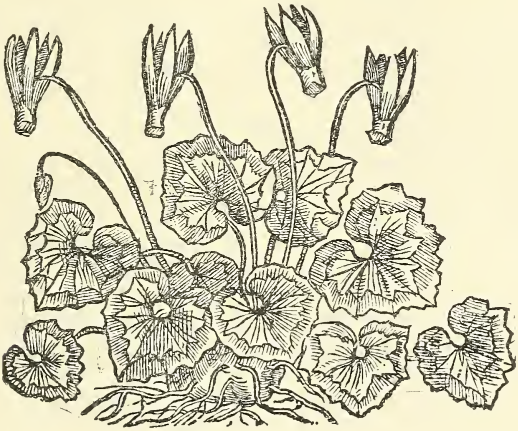
Mr. C. Tate Regan, of the British Museum (Natural History), South Kensington, has written an important monograph on the curious deep-sea fish known as Ceratias, a wonderful example of which can be seen in the Museum of Fisheries and Shipping at Hull. During the past twelve months he has had an exhibit in the British Museum showing the male of this rare species, both in its complete form and in section, illustrating its anatomical details. Now that the exhibition is over, the original specimens have been presented to the Corporation of Hull, and are now on exhibition in the Fisheries Museum. The animal is covered by a large number of spines.

BRITISH SPIDERS.

Four series of particularly attractive coloured illustrations of Common British Spiders, and their webs and nests, have been issued by the British Museum (Natural History). Each contains five cards, and is sold at one shilling. According to the leaflet which accompanies each series : ' Spiders belong to the great division of the animal kingdom known as Arthropoda (animals with jointed legs), and form, with the scorpions, mites, ticks, and harvestmen, the class Arachnida within this division. Generally speaking, the Arachnida may be distinguished from the other Arthropoda by having four pairs of legs ; spiders may be further distinguished from the scorpions, mites, ticks, and harvestmen, by having the two chief divisions of the body—the cephalothorax in front and the abdomen behind—separated by a narrow " waist " and the abdomen (except in one small family) unsegmented. The most characteristic feature of spiders, however, is the possession of small appendages on the abdomen, the spinnerets, with which are associated glands producing silk. Perhaps it is because of these silk glands and the varied uses to which the silk can be put that spiders have so successfully adapted themselves to different surroundings extending over vast areas. They are distributed over almost the whole of the globe, with exception of the extreme north and south ; they are present on great continents and oceanic islands, in sandy deserts and marshy plains, in grasslands, valleys and forests, in freshwater ponds and between tide marks on the sea shore.'

GERARD'S HERBALL : OR GENERALL HISTORIE OF PLANTES.*

We should like to congratulate all concerned in the production of this magnificent volume, on the way it has been produced, the type and illustrations being very reminiscent of the original edition. The descriptions are very quaint, and we may perhaps be pardoned if we quote a portion of one relating to the Water Dock : 'The Monks Rubarb is called in Latine, *Rumex sativus*, and *Patientia*, or Patience, which word is borrowed of the French, who call this herb *Patience* : after whom the Dutchmen also name this pot herb Patientie : of some, *Rhubarbarum Monachorum*, or Monks Rubarb, because as it seem some Monke or other hath used the root hereof in stead of Rubarb. Bloudwort or bloudy Patience is called in Latine *Lapathum sanguineum* : of some *Sanguis Draconis*, of the bloudy colour wherewith the whole plant is possest : it is of pot-herbs the chiefe or principall, having the propertie of the bastard Rubarb, but of lesse force in his purging qualitie.' We are permitted to reproduce one of the illustrations.



Spring Sow-bread.

HARROGATE WATERS.

From a folk-lore and antiquarian point of view, it is rather refreshing to read the following paragraph, apparently written

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* By Marcus Woodward. London : Gerald Howe, xix.+303 pp., 21/- net.

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in all seriousness, in a Yorkshire newspaper in this, the twentieth century : ‘ The possibility of important additions to Harrogate’s supply of mineral waters is indicated in the report of a Somersetshire water diviner who was employed by the Baths and Wells Committee to survey Harlow Hill Wood, Harlow Field, and parts of Oakdale Golf Course, where a sulphur spring was recently found on the twelfth fairway. The diviner, who operated with a fork of hazel held in the hands, was called in *following a geological survey made by Professor Gilligan*, and his estimates of the total volume of water at various places amount to about 100,000 gallons a day. In no case does he express an opinion as to the nature of the new supplies—whether they are mineral or plain. The diviner also indicates the presence of a large quantity of water in the rough land near the beck where, he says, it would be found in two or three different strata. This, he suggests, would be well worth the cost of a shaft, which would enable the different sources to be tested separately.’

ECOLOGY OF FOSSIL CORAL REEFS.

In *The Journal of Ecology* for February, W. J. Arkell has a paper on ‘ Aspects of the Ecology of certain Fossil Coral Reefs.’ He begins by saying that : ‘ It is commonly known that during a part of the Upper Jurassic period coral seas covered much of the region now occupied by north-western Europe. The remains of the coral reefs, sandbanks, and shell beds which were formed during the phase are known collectively as the Corallian formation, or sometimes as the Lusitanian. The outcrop of these rocks in England forms a chain of low hills running along the centre of the lowland tract floored by the Oxford and Kimmeridge Clays, parts of which are designated the Vale of Blackmore, the Vale of the White Horse, the Vale of Aylesbury, the Lowlands of Bedford, Huntingdon and Fenland, the Vale of Lincoln, and the Vale of Pickering. The Corallian formation represents over most of this area a shallow, clear-water episode, sandwiched between two thick clay formations. During the deposition of the Oxford and Kimmeridge Clays the seas of northern Europe were relatively deep and muddy. The rich mulluscan and brachiopod faunas of the Lower Oolite limestones were poorly represented, except by cephalopods and oysters, and there was a revival of the great marine reptiles, the Pliosaurs, Plesiosaurs, and Ichthyosaurs, belonging to genera common in Lias. The conditions were the very antithesis of those required for the growth of reef-forming corals.

HONEY BUZZARD IN EAST YORKS.

We learn from the *Yorkshire Weekly Post* of May 12th, that :—‘ Recently in the grounds of Thorpe Hall, near

Bridlington, the residence of Sir Alexander Macdonald of the Isles, a Buzzard was found alive, but in a state of extreme emaciation. The plumage of these birds is very variable, but notwithstanding the draggled state of its feathers, the specimen showed, in Sir Alexander's opinion, the distinct characteristics of the Honey Buzzard. The species is now mainly known in this country as a spring and autumn visitor on passage, and probably the bird in question was beaten down on its long journey by the heavy gales that prevailed at the time.'

THE WHIN SILL.

At a recent meeting of the Mineralogical Society, A. Holmes and H. F. Horward read a paper ' On the age and composition of the Whin Sill and the relative Dikes of the North of England.' The rocks of the Whin Sill and its associated dikes are quartz-dolerites of substantially identical composition. Dikes of this series run north by east. They are quite distinct from the system of tholeüte dikes to which the Bingfield dike, the ' Brunton type ' of Teall, belongs. A pebble of quartz-dolerite in the Upper Brockram of George Gill, Brackenber Moor, near Appleby, has been proved by identical analysis to be definitely of the Whin Sill type. This, with other evidence, indicates that the age of Whin Sill and its associated dikes is post-Westphalian and pre-Upper Brockram.

BRITISH LEPIDOPTERA.*

During the past quarter of a century it has been our regret to record the deaths of a whole army of lepidopterists and collectors ; and we wondered whether the new generation was following up the subject with the same enthusiasm. Apparently this is so, otherwise there would be no call for a volume of nearly one thousand pages, which has been prepared by Mr. Edward Meyrick. Our readers will remember that over thirty years ago the author issued a Handbook of British Lepidoptera, which has long since been out of print. The present work is on similar lines, but since the previous handbook was published, the author has had many thousand specimens through his hands, an examination of which has altered his views on classification, and in other ways has enabled progress to be made. He has also devoted particular attention to the ' Micros,' and while the names of several species have been supressed, for different reasons, at least one hundred have been added. Mr. Meyrick believes in brevity, and has endeavoured to give full particulars of every species of British Lepidoptera in such a way that any particular form can be identified, in addition to which he has remarks

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* A Revised Handbook of British Lepidoptera, by Edward Meyrick. London : Watkins & Doncaster, 914 pp., 18/- net.

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on distribution, the larva, food plants, etc. The volume is also illustrated by numerous sketches. Naturalists should sincerely thank the author for his conscientious work, and we can only hope the sale of the book will repay him for what he has done. Possibly the following simple description of a species will enable our readers to know how thoroughly the work has been done.

TELESILLA AMETHYSTINA.

'*Telesilla* Herr.—Schaff. Head rough-scaled; eyes ciliated. Antennæ very shortly ciliated. Palpi moderate, porrected, second joint rough-scaled beneath, terminal short, obtuse. Thorax with anterior and posterior crests. Abdomen with slight basal crest. Tibiæ rough-scaled. Hindwings 5, approximated to 4. Monotypic; correlated with Plusia. 1. *T. amethystina* Gubn. 34-38 mm. Forewings light purple-pinkish; subbasal line whitish, edged blackish anteriorly; first and second lines pale, internally finely blackish-edged, first preceded by a brownish fascia; orbicular and reniform faintly edged brownish, preceded and separated by quadrate dark brown laterally white-edged spots, second larger and forming part of a brown median fascia; a suffused golden-brown terminal fascia. Hindwings light greyish, termen darker. Cumberland, once, probably a casual immigrant; Central Europe to China and Japan; 6. Larva green; dorsal and subdorsal lines white; lateral white shading to red at extremities: on umbels of Daucus and Peucedanum; 7, 8 . . .'

——:o:——

Tarka the Otter, by **Henry Williamson.** London: G. P. Putnam's Sons, Ltd., viii.+256 pp., 7/6 net. Mr. Williamson's fascinating stories are well known to young naturalists, and the fact that the present volume has reached its third edition in a few months is an indication of its popularity.

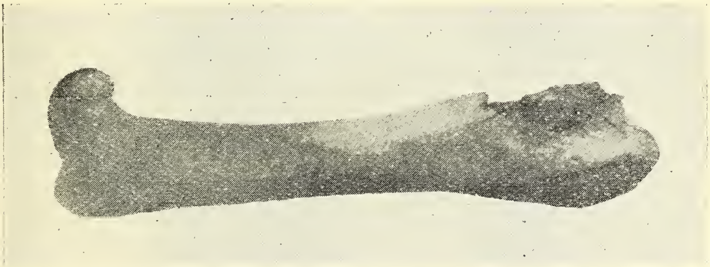
Popular Handbook of Indian Birds, by **Hugh Whistler.** London: Gurney & Jackson, xv.+438 pp., 15/- net. This is a solid, scholarly treatise, dealing with species of birds to be met with in the great Indian Empire, by one who is evidently especially familiar with his subject. The publishers point out that 'There are few countries where Nature is so lavish with her gifts as India, where her beauties intrude themselves so persistently on even the most heedless. An Indian garden is full of birds. Chattering, squeaking parties of Babblers tumble along the paths. Blue Jays, Sunbirds, and Bee-eaters catch the bright sunlight with their brilliant colours. Strange and persistent calls echo from the foliage of Peepul and Sheesham. No wonder is it that the new arrival in India asks to be told of a book on birds—a book suitable for the ignorant beginner. There are many books on Indian birds, but the majority are either too expensive or too technical for his needs, being written for the advanced student,' and that this volume is intended to supply the need. There are coloured and other illustrations in the text, from drawings by H. Grönvold.

PELICAN IN YORKSHIRE PEAT.

E. T. NEWTON, F.R.S.

DURING the excavations for King George Dock, at Hull, an interesting bone was dug up, which our keen friend, Mr. T. Sheppard, Director of the Hull Municipal Museum, at once noted as of peculiar interest, and sent it to me for identification. It is the right femur, more than 5 inches long, of a large bird and too large for any of our British birds.

This femur is 5¼ inches long (=134 mm.) and ⅝ in. (=17 mm.) wide at the smallest part of the shaft. The inner distal condyle is wanting, but otherwise the bone is almost perfect, only the most prominent parts being abraded. Fortunately, the outer condyle is preserved, and its under surface bears the peculiar crest, which articulates between the upper ends of tibia and fibula, and is so specially characteristic of the avian femur. The upper surface of this fossil, towards the outer side, is marked by a long ridge, which extends from near the trochanter for two-thirds the length of the bone. The surface of the bone is well preserved in the region of the trochanter, but there is no pneumatic foramen such as is seen in this region in Storks.



A comparison with the femurs of Swan, Crane, Eagle, Turkey and others shows that the fossil is too large for either of them, and differed in certain particulars. A further search in the Hunterian Museum, at the Royal College of Surgeons, which, by the courtesy of the officers of that Institution, I was enabled to make, showed that the White Stork's femur was too small and unlike in form, and further, has a very distinct pneumatic foramen on the upper surface, just within the great trochanter. In size, the Marabou Stork's femur agrees with the fossil, but it also has a distinct pneumatic foramen. Unexpectedly, the femur of a Pelican, although rather small, was found to agree so closely with the fossil in many essential points, and also in the absence of any obvious pneumatic foramen, that there seemed little doubt that the fossil femur was that of a Pelican; but it is somewhat larger than the specimen of *Pelecanus onocrotalus*, with which I was able to compare it, and this raises the question as to its specific identity.

The age of the deposits from which the bone was obtained is uncertain. Mr. T. Sheppard tells me that the dock excavation extended from old Humber silt, through peat, a cockle bed and other deposits, to boulder clay; but the workmen could not say from which particular bed the bone was obtained. The colour (dark brown) and condition of the bone itself is similar to that of many bones that have been found in peaty beds elsewhere; it seems reasonable, therefore, to infer that it came from the peaty bed exposed in the excavations.

The interest attaching to the discovery of semi-fossil remains of a Pelican in this country is great, and any information as to its presence is valuable; but this is not the first record of its occurrence. Curiously enough, just 60 years ago (1868*), the late Alfred Newton, of Cambridge, that great authority on all avian matters, recognised the humerus of a Pelican from the peat of Norfolk.

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Alpine Hare in Lancs.—During the season just closed, over 200 Alpine Hares were killed on our local moors without any apparent diminution in their number. Up to April 20th there was scarcely any change noticeable in their pelage, but by the 30th practically all of them were in their summer coats. This hare sometimes places its young in specially constructed burrows, which it seals during the daytime in the same manner as the rabbit. Since its introduction this hare has spread to all the surrounding hills, even as far as the Kinderscout district, and is now very firmly established.—Fred Allen, Greenfield, Yorks.

Tipula vittata Mg. in Yorkshire.—This species has very characteristic wing markings, so that it is easily determined; it is, however, by no means a common species, and its European distribution is northerly. Mr. F. W. Edwards informs me that he has never met with it himself, and that the British Museum only has specimens from S. Devon and Warwickshire. I have found it regularly at Austwick, and occasionally in other Yorkshire localities, the dates being from the end of March to the end of May. On May 11th this year I saw the females of this species ovipositing on damp soil by the side of a small stream, the soil had plenty of old and new roots, and rhizomes of reed and other grasses, which may be the food of the larvæ.—Chris A. Cheetham.

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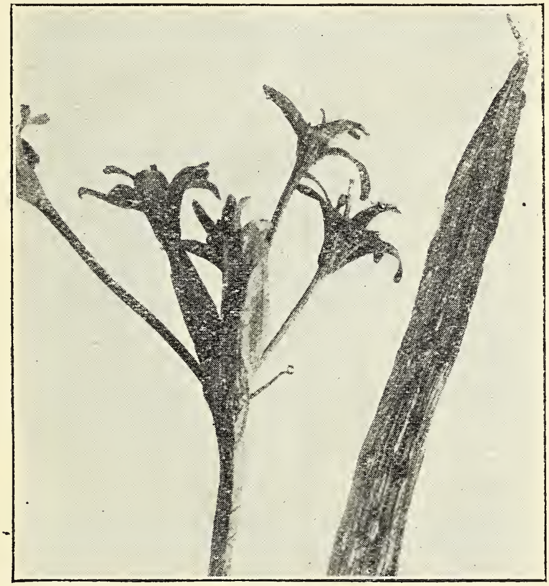
* *Proc. Geol. Soc.*, 1868, p. 2; and *ibid*, 1871, p. 702.

USTILAGO ORNITHOGALI (SCHMIDT ET KZE.) MAGNUS, NEWLY RECORDED IN BRITAIN.

F. A. MASON, F.R.M.S.

EARLY in April, Mr. G. W. Bramley forwarded leaves and flowering stems of *Gagea lutea* Schult. attacked by a fungus which proved to be *Ustilago ornithogali* (Schmidt et Kze.) Magnus. As there appeared to be no record of the occurrence of this species in Britain, and as the amount of material was scanty, I visited the locality at Tadcaster in which the specimens had been collected (Lee's 'Flora of West Yorkshire,' *Bot. Trans. Y.N.U.*, II., 1888), and obtained further examples of the 'smutted' leaves; some of these were sent to Miss E. M. Wakefield, Kew, who confirmed the identity of the fungus and commented on its absence from the British list.



At the time of my visit on April 26th, the plants were in full bloom, and fully fifty per cent. of them were showing more or less serious attack by the fungus. The accompanying photograph illustrates the appearance of infected plants. Those leaves on which sori have developed exhibit very rapid withering at their tips, and it was possible by this characteristic feature to detect the diseased plants from some distance away.

The following description of the fungus is from Rabenhorst's 'Kryptogamen-flora,' I. Pilze, I. Abt., 2te. Aufl., 1884, p. 86. *Ustilago ornithogali* (Schmidt et Kze.).

Synon : *Uredo ornithogali* Schmidt et Kze. (Deutsch. Schwamme, 217), *Cæoma ornithogali* Schlechtd., *Ustilago umbrina* Schröter, *Ustilago heterospora* Niessl, Exsicc : Rabh. Fungi Europ., No. 1482, 1996, Thümen, Fungi Austr. No. 342.

Sori occur in the leaf tissue of the host producing elongated pustules up to 10 mm. in length, attenuated at both ends, and frequently confluent ; at first covered with a grey lustrous cuticle, later dehiscing longitudinally or irregularly with liberation of the spore-mass.

Spores very irregular in shape, elongated-polygonal, often apiculate on one side ; also very variable in size, 10-18μ in diameter, to 25μ in length ; light brown in colour, transparent, smooth.

On the Continent the fungus has occurred on *Ornithogalum umbellatum* and on most of the European species of *Gagea*.

I am indebted to Miss Wakefield for the information that the combination given in the heading is due to Magnus, *Hedwigia*, 14, 1875, p. 19.

As a good example of a fungous gall it may also be added to the records of the Plant Galls Committee, for Yorks. Mid. W. Div., V.C. 64.

——: o :——

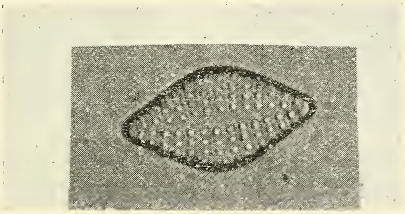
Some Yorkshire Bat Parasites.—Included among a selection of parasites sent to me from Helmsley by Mr. S. Gordon, were two tubes of specimens from Daubenton's Bat and the Noctules. These included the following species :—*Acari* : *Leiognathus uncinatus* Can. from the Noctules. This is apparently rare, and the Rev. J. E. Hull informs me that he has never previously seen it. *Pteroptus vespertilionis* L. from Daubenton's Bat. This is more common than the preceding species. I have it from Natterer's Bat, taken at Sedworth, Berks., and Mr. Hull tells me that he has taken it on the Pipistrelle, the Long-eared Bat, and the Field Mouse. DIPTERA : *Listropodia pedicularia* Latr. (*Nycteribia hermanni* Leach). Several specimens were taken on Daubenton's Bat. Mr. Jas. E. Collin refers two specimens to the variety, *blasii* Kel. SIPHONAPTERA : *Ischnopsyllus hexactenus* Kolen. A single specimen was taken on Daubenton's Bat. *I. elongatus* Curtis. A single example from the Noctule. All these species, with the exception of the *Listropodia*, seem to be new Yorkshire records.—GEO. B. WALSH, Scarborough.

THE DIATOM FLORA OF THE RIVER WENT.

M. H. STILES, F.R.M.S., AND R. A. BELLAMY.

During the past two years we have made many examinations of diatoms collected from various parts of the West Riding.

Our first gatherings were taken at Wentbridge, where the Great North Road passes through a picturesque valley about 10 miles north of Doncaster. From that point the Went continues its course, eventually falling into the Don not far from Snaith. This section of the Don, from its connection with the Ouse and the Humber, is more or less tidal, and to a certain extent influences its modest tributary the Went, resulting in the occasional presence of diatoms usually characterised as belonging to brackish or marine habitats.



So far we have recorded 129 species and varieties, forming the largest and most representative Diatom Flora of any district we have worked upon. Of these (marked with an asterisk), thirty-four are not recorded in Wests' 'Alga Flora of Yorkshire,' 1901.

The nomenclature adopted is that followed by H. van Heurck in his 'Treatise on the Diatomaceæ,' 1896.

Amphora ovalis Kutz.
  var. _gracilis_.
  var. _affinis_.
  var. _pediculus_ forma _minor_.
Cymbella ehrenbergii Kutz.
C. cuspidata Kutz.
*_C. obtusa_ Greg.
C. affinis Kutz.
C. cistula Hempr.
  var. _maculata_.
Encyonema cæspitosum Kutz.
E. ventricosum Kutz.
Stauroncis phœnicenteron Ehr.
*_S. spicula_ W. J. Hickie.
S. anceps.
*_S. smithii_ Grun.
*_S. nobilis_ Ehr.
Navicula major Kutz.
N. viridis Kutz.
  var. _commutata_.
*_Navicula mesolepta_ Ehr. var. _termes_.
N. oblonga Kutz.
N. peregrina Ehr. var. _menisculus_ forma _upsaliensis_.
N. gracilis var. _schizonemoides_ H. van H.
N. radiosa Kutz.
  var. _acuta_.
N. viridula Kutz.
* forma _minor_.
* var. _slesvicensis_.
N. rhynchocephala Kutz.
* var. _amphiceros_.
N. cryptocephala Kutz.
N. humilis Donk.
*_N. digito-radiata_ Greg.
N. anglica Ralfs.
* var. _subsalina_ Grun.
N. gastrum Ehr.

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Navicula elliptica Kutz.
var. _ovalis._
N. integra Wm. Sm.
N. brebissonii Kutz.
N. gibba Kutz.
*_N. globiceps_ Greg.
N. cuspidata Kutz.
N. ambigua Ehr.
* var. _craticula._
N. amphisbæna Bory.
N. limosa Kutz.
var. _gibberula._
N. ventricosa Donk.
N. iridis Ehr. var. _amphigomphus._
var. _affinis._
var. _producta._
N. binodis Ehr.
*_N. apiculata_ Breb.
*_Van Heurckia viridula_ Breb.
vulgaris H. V. H.
Amphipleura pellucida Kutz.
Amphiprora paludosa Wm. Sm.
Pleurosigna attenuatum Wm. Sm.
P. spencerii Wm. Sm.
* var. _smithii._
P. acuminatum Grun.
P. scalproides Rab.
Gomphonema constrictum Ehr.
var. _capitatum._
G. olivaceum Kutz.
G. montanum Schuman.
G. ventricosum Greg.
Rhoicosphenia curvata Grun.
*_Achnanthes delicatula_ Kutz.
A. lanceolata Breb.
Achnanthidium flexellum Breb.
*_Cocconeis scutellum_ Ehr.
C. placentula Ehr.
*_C. dirupta_ Greg.
*_C. distans_ Greg.
Eunotia arcus Ehr.
*_E. pectinalis_ Kutz. forma _curta._
Synedra pulchella Kutz.
* forma _major._
var. _lanceolata._
*_S. vancheria_ Kutz. var. _perminuta._
*_S. ulna_ Nitzsch. var. _lanceolata._
var. _splendens._
Synedra acus Kutz.
Fragilaria capucina Desmaz.
*_F. construens_ Ehr. var. _venter._
var. _binodis._
F. harrisonii Wm. Sm.
F. mutabilis.
Diatoma vulgare Bory.
D. elongatum Ag.
Meridion circulare Ag.
*_Denticula tenuis_ Kutz. var. _inflata._
Tabellaria flocculosa Kutz.
Cymatopleura elliptica Wm. Sm.
var. _constricta._
var. _hibernica._
C. solea Wm. Sm.
var. _apiculata._
Surirella biseriata Breb.
S. robusta Ehr.
S. ovalis Breb. var. _ovata._
var. _crumena._
var. _pinnata._
var. _minuta._
Campylodiscus hibernicus Ehr. var. _noricus._
Hantzschia amphioxys Ehr.
Nitzschia tryblionella Hantzsch.
* var. _levidensis._
* var. _littoralis._
*_N. hungarica_ Grun.
N. acuminata Wm. Sm.
N. apiculata Grun.
*_N. dubia_ Wm. Sm.
*_N. paradoxa_ Grun. var. _major._
N. sigmoidea Wm. Sm.
N. vermicularis Grun.
*_N. sigma_ Wm. Sm. var. _rigida._
* var. _rigidula._
* var. _sigmatella._
N. linearis Wm. Sm.
N. vitrea Norman.
N. fasciculata Grun.
N. acicularis Wm. Sm.
Melosira varians Ag.
Cyclotella meneghiniana Kutz.
*_Actinoptychus undulatus_ Ehr.

Of the above the specimens calling for special notice are the following :—

Stauroneis spicula, recorded by Philip and Mills in 'The Diatomaceæ of the Hull District' (_Trans. Hull S. and F. N. Club,_ Vol. I., No. 4, 1901), but not in West's list—a denizen of brackish water noted by van Heurck as very rare.

Navicula ambigua var. _craticula,_ found in the Hull district by Philip, but not mentioned by West, referred to by van Heurck as rare.

Navicula globiceps, recorded by Norman (Hull, in the

Marfleet Drain); not in West. Van Heurck describes it as rare. We have only met with one specimen.

Actinoptychus undulatus. The occurrence of this in a freshwater gathering many miles from the sea was a great surprise. It had evidently been washed up by successive tides.

Cocconeis distans, one of our earliest and most interesting finds. We have only come across one valve which differs slightly from that described by van Heurck. Fortunately, we were able to get a photograph of it, which we now value, as the actual specimen has been lost. It was found by Philip in the River Humber. The following is a description of the form we have met with :—Valve broadly lanceolate, with apices obtuse, slightly produced; hyaline area lanceolate, rather narrow. Length, 32·5 mikrons; breadth 17·5 μ; Striæ, 4 in 10 μ, formed of 2 to 8 coarse puncta arranged in longitudinal lines.

In view of the departure from the normal type we propose to distinguish it as *Cocconeis distans* var. *wentica.*

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The Biology of the Frog, by **Samuel J. Holmes.** London: Macmillan & Co., x.+370 pp., 10/6. A series of lectures delivered at the University of Michigan was so popular that a third edition of the volume containing them was called for some time ago, although it has only just reached us. Quite apart from the wealth of detail, there is no doubt that much of the popularity of the volume is due to the abundance and excellence of the illustrations, both in black and colours. The species described are those more familiar with American zoologists, but, notwithstanding that, there is much likely to be of value to the English worker.

The Elements of Vegetable Histology, by **C. W. Ballard.** London: Chapman & Hall, Ltd., xviii.+289 pp., 16/- net. This is also of American origin, and is also a revised and enlarged edition. Here again the wealth of illustration, combined with the simplicity of the descriptive matter, make a particularly useful volume for the student. A large section is devoted to various forms of section-cutting and other microscopic work. There are chapters on Chemical Reaction of Plant Tissues, Staining, The Plant Cell, Covering, Supporting, Absorption, Conducting Tissues, Tissues for Synthesis, Assimilation and Storage; Cell Contents; Root, Stem, Leaf, Flower, Fruit, Seed Structures; and Microscope Accessories.

Seashore Animals of the Pacific Coast, by **Myrtle E. Johnson** and **Harry J. Snook.** London: Macmillan & Co., xiv.+659 pp. 32/- net. A further magnificent volume from America reaches us, with coloured and other illustrations of various forms of marine life. It is by the Professor of Zoölogy in the San Diego State College, California, and the Head of the Biology Department of the Stockton High School, also in California. The value of the monograph is enhanced by the fact that most of the illustrations are original. There is an exceedingly good index and a glossary. The plates relate principally to jelly fish, anemonæ, worms, and Nudibranch Molluscs or Sea Slugs, and show the wonderful hues obtained by these lower forms of life. The volume is divided into twelve parts, the first dealing with Collecting Grounds and How to

Collect, and then Classification of Animals ; and after describing the different classes of marine life, ends with Methods of Preserving Animals.

Wild Animal Pets, by **William** and **Irene Finley.** London : Charles Scribner's Sons, xiv.+311 pp., 10/6 net. Probably the most striking feature of this book is the large number of illustrations, and the extraordinary variety of animals which can be looked upon as pets. Many of these are shown as being fed or handled, and among the scores of reproductions from photographs are those of the bear, panther, porcupine, wolf, squirrel, moose, armadillo, opossum, deer, goat, etc. The book would make a suitable school-prize.

Gideon Algernon Mantell, by **Sidney Spokes.** London : John Bale, Sons, and Danielsson, Ltd., xv.+263 pp., 12/6 net. Older geologists will remember the fascination which a perusal of geological treatises by Gideon Mantell had. The 'Wonders of Geology' was one of the memoirs by this surgeon and geologist in Lewes, which was read by thousands. The author of the present volume seems to have lost no opportunity of referring to his subject in every possible manner, and has even given an illustration and account of Dr. Mantell's spine, which had a lateral curvature due to an accident, and was bequeathed by the doctor to the Hunterian Museum of the Royal College of Surgeons of England.

The Geology of the Country near Hastings and Dungeness. H.M. Stationery Office, v.+104 pp., 3/- net. The Geological Survey has recently published a memoir which deals with the area so well known to Mantell. As collectors are aware, the Hastings area is a particularly good one, and in this memoir especial attention is devoted to maps, drawings and reproductions of photographs of desirable sections, with lists of fossils, minerals, etc. In addition there are chapters dealing with Water supply and other economic aspects.

Rossel Island : An Ethnological Study, by **W. E. Armstrong.** London : Cambridge University Press, xxviii.+274 pp., 18/- net. The author was formerly Assistant Anthropologist to the Government of Papua. In this general survey of the culture of the island, he pays particular attention to the unusual and complex monetary system. He deals with the island from various ethnographical and ethnological points of view, and illustrates his chapters by photographs of the natives, canoes, stone and metal implements, methods of preparing food, building houses, etc. The Rossel Islanders seem to be particularly fond of ornamentation of various kinds, some of which have even gone so far as to cause deformities. The volume makes fascinating reading, and is a substantial contribution to our knowledge of these out-of-the-way places.

Papers on the Ethnology and Archæology of the Malay Peninsula, by **Ivor H. N. Evans.** London : Cambridge Univeristy Press, x.+164 pp., 15/- net. Of a somewhat similar type is a collection of essays and papers gathered together by the author, and these are now presented in an attractive form. The volume is divided into sections dealing with Pagan Races, Malay Beliefs ; Malay and other Technology ; and Archæology. We imagine the archæological section will appeal to most of our readers from the extraordinary variety of specimens figured and described, a variety rarely met with in other areas of a similar size ; the pottery, implements, carvings, and even gold coins figured in the early civilization of Malaya. To some extent those interested were made familiar with some of the attractions of the country at Wembley in recent years, and the information thus obtained can now be supplemented and augmented by this volume. The illustrations of some of the stone implements might easily have been from objects picked up on the Yorkshire Wolds. This not only applies to the axes and adzes, but the curious 'pounders with grip depressions,' quartz and other pebbles with abraded faces, and so on.

SHELLS IN ANCIENT EGYPTIAN TOMBS.

J. W. JACKSON.

A LARGE collection of shells, some in the form of necklaces, etc., taken from ancient Palestinian tombs by Sir Flinders Petrie, and now in the Museum at Hull, have been submitted to me, and the following is a list of the various species, with an indication of their present habitat. The shells are principally from Gerar, Palestine. They relate to the Egyptian occupation, and date about 650 to 1209 B.C. The letters F.L., etc., refer to positions on the plans, made while excavating, and the numbers refer to ground levels at which the specimens were found.*

Location No.	*Species.*	*Present habitat.*
BU.	*Cardium subrugosum* Sow. (fragment).	Indo-Pacific.
BL. 199	*Triton variegatus* Lam. (young example), perforated at back of body-whorl).	Indo-Pacific.
——	*Murex branderis* L. (two examples).	Mediterranean.
FL. 190.	*Cypræa pantherina* Sol. (rubbed-down).	Red Sea.
BN. 196.	*Cypræa arabica* L. var.	Red Sea and Indo-Pacific.
——	*Cypræa cruenta* Gmel.	Indo-Pacific.
AA. 190.	*Cardium rusticum* L. (two valves).	Mediterranean.
——	*Pectunculus violascens* Lam. (one valve).	Mediterranean.
——	*Tridacna elongata* Lam. (one left valve).	Red Sea, etc.
FL. 182.	*Cassis undulata* Lam.	Mediterranean.
AC. 201.	*Cypræa annulus* L. (three specimens : two rubbed down on back in characteristic fashion).	Red Sea and Indo-Pacific.
FL. 186.	*Cypræa annulus* L. (seven specimens : six rubbed down on back).	Red Sea and Indo-Pacific.
Do.	*Cypræa helvola* L. (one example).	Red Sea and Indo-Pacific.
A. 194.	*Strombus tricornis* Lam. (juvenile example).	Red Sea, etc.
Do.	*Conus tæniatus* Hwass. (apex rubbed away).	Red Sea, etc.
KD. 186.	*Cardium rusticum* L. (two valves with umbone, perforated for threading).	Mediterranean.
Do.	*Purpura hæmastoma* Lam. (two specimens).	Mediterranean.
——	*Cerithium eryth æense* Lam.	Red Sea.
B. 195.	*Natica powisiana* Recl. (one example).	Red Sea.
CJ. 190.	*Terebra consobrina* Desh. (perforated at back of aperture).	Red Sea.
182.	*Purpura* (*Thalessa*) *bufo* Lam. (large shell, with apex perforated).	Indian Ocean, etc.
A. 194.	*Triton* (*Simpulum*) *olearium* L. var. (large specimen).	Indo-Pacific.
AM. 201.	*Tridacna elongata* Lam. (broken valve).	Red Sea, etc.
Eg. 188.	*Conus mediterraneus* Hwass. (fifteen small shells).	Mediterranean.

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* See Catalogue of Palestinian Antiquities from Gerar, 1927. British School of Archæology.

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Location No.	*Species.*	*Present habitat.*
BN. 198.	*Cypræa annulus* L. (one perfect example).	Red Sea, etc.
Do.	*Strombus fasciatus* (Born.) (one example with perforated apex).	Red Sea, etc.
Do.	*Donax* sp. (two valves).	Red Sea, etc.
HL. 183.	*Conus mediterraneus* Hwass. (one well-worn specimen).	Mediterranean.
Eg. 188.	*Conus mediterraneus* Hwass. (one example).	Mediterranean.
BZ. 198.	Columella of large *Triton* (probably *T. variegatus*).	
Do.	*Strombus gibberulus* L. (one example).	Red Sea, etc.
Do.	*Nassa gibbosula* L. (two examples).	Mediterranean. (Alexandria, etc.).
Do.	*Mitra solandri* Reeve (one example, with perforation behind aperture).	Red Sea.
Do.	*Clanculus pharaonis* L. (one example, with perforation behind aperture).	Red Sea.
Do.	*Cypræa annulus* L. (one perfect example).	Red Sea, etc.
Do.	*Conus virgo* L. (one example, and fragment rubbed down).	Red Sea, etc.
Do.	*Conus mediterraneus* Hwass. (several)	Mediterranean.
Do.	*Conus omaria* Brug. (one example).	Red Sea, etc.

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The Origin of the Species, by **Charles Darwin.** Messrs. T. Nelson & Sons are to be congratulated in issuing this volume as No. 811 of their Everyman's Library at the small price of 2/- (xxiv.+488 pp.). In addition to the book itself, there is an admirable introduction by Professor Sir Arthur Keith, a complete list of Darwin's published volumes, additions and corrections to the text in successive issues of the work, and a historical sketch.

Forest Folklore, Mythology, and Romance, by **Alexander Porteous.** London: G. Allan & Unwin. 319 pp., 12/6 net. The writer certainly has covered an enormous field, much greater than might have been thought possible. He begins 'In the Beginning' by describing the vegetation of the Archæan Age, and follows with the plants of the later rocks, deals with tropical forests, traditional forests, those of Romance and Myth, Early Forestry, Ancient Foresters and Customs. Then he refers to Temples, Druids, Classic Groves, Spirits, Witches, Fairies, Demons, Wild Huntsmen, and Wood-Nympths. He then follows with Mythical, Sacred, Traditional, Famous, Curious and Marvellous Trees, Petrified Forests, Divining Rods and Wands.

Fatalism or Freedom, by **C. Judson Herrick.** London: Kegan Paul, Trench Trubner & Co., Ltd., 106 pp., 2/6 net. This little work contains the answer of a Biologist at the University of Chicago to the question of Fatalism or Freedom. To use the author's own words, 'an attempt has been made to evaluate human freedom in terms of the common meaning of the word in so far as this can be done within the limits set by the methods of natural science. This naturalistic treatment requires that the concept of uncaused action and all metaphysical categories, absolutes, and sanctions be rigorously excluded. Such limited freedom will not be acceptable to those who demand the divine privilege of creating something out of nothing or of choosing to which of the laws of nature they will conform their actions. The people who make claim to these powers have difficulty in making good in practice. But natural freedom as here defined meets every practical need; and it embraces the noblest human capacities and satisfactions.'

THE MOSSES AND HEPATICS OF THE SOUTHERN PENNINES.

F. E. MILSOM, B.Sc.

THE following account of the mosses and hepatics more frequently met with in South Yorkshire has been written, not for the specialist, but for the novice in bryology, in the hope that it may tempt him to give some attention to a field in which more workers are wanted. All of the structural details given below can be easily observed with a pocket lens. It is assumed that the reader has access to Dixon's 'Student's Handbook of British Mosses,' and Macvicar's 'Student's Handbook of British Hepatics.'

A piece of scenery is to be imagined, typical of the country between Huddersfield and the Derbyshire border—a stream flowing in a bed of Millstone Grit between narrow belts of woodland at an elevation of, say, 700 feet. Walking by the banks of the stream one gradually ascends, the trees becoming more and more sparse, and finally almost disappearing, the bed of the stream meanwhile becoming more and more rocky. There are small cuttings, showing the typical Middle Grit alternation of sandstone and shale, and also miniature waterfalls at intervals. Finally the stream diminishes to a mere trickle on the bare moorland at an elevation of 1500-1600 feet.

Commencing, then, to follow the course of the stream through the woodland at the lower level, the first moss to strike one's eye is most likely to be *Dicranella heteromalla*, the dark green, silky patches of which are very conspicuous on every piece of bare ground. It is more usually sterile, but quite frequent in fruit, which fruit is necessary to distinguish it easily from the allied *D. cerviculata*, fairly common on the moorlands.

On the ground at the foot of trees will be found plentifully the two hepatics, *Lepidozia reptans* and *Cephalozia bicuspidata*, both easily remembered when once seen, the former with its three- to four-lobed, and the latter with its longly-pointed, bi-lobed leaves.

In similar places will certainly be seen the handsome moss *Mnium hornum*, large and conspicuous, and at its best when growing in the shade. Often associated with it is another common moss, *Catharinea undulata*, at first sight much resembling the *Mnium*, but on closer investigation bearing an unmistakable family likeness to the *Polytrichums*. The commonest member of the latter genus, *P. commune*, will be found particularly in rather swampy places near the banks of the stream, and cannot be overlooked, its stiff, opaque leaves (opaque owing to the lamellæ on the wide nerve) and large size making it conspicuous. In the genus *Catharinea* the nerve is narrow and the lamellæ few, but this point serves to distinguish it under the lens from *Mnium hornum*, the nerve of which has no lamellæ.

On damp tree-roots are likely to be found any of three members of the genus *Plagiothecium*, *P. denticulatum*, *P. sylvaticum*, *P. elegans*. These three species cannot be distinguished with certainty from each other except by the microscope, but the nerveless, strongly complanate leaves and a characteristic shininess easily determine the family.

On dryer ground at the edge of the woodland will be found several members of the genus *Hypnum*, pleurocarpous (creeping) mosses, of which two of the commonest are *H. cupressiforme* and *H. schreberi*. The first named is very common and is very variable. As its name denotes, the leaves appear to overlap each other similarly to the scales of a coniferous fruit. *H. schreberi* is distinguished from other commonly-occurring *Hypna* by its red stems.

On decaying stumps, one is certain to find two of the mosses commonly bearing gemmæ, viz., *Tetraphis pellucida* and *Aulacomnium androgynum*. The former has its gemmæ in a little cup formed by metamorphosed leaves at the top of the stem ; the latter has the gemmæ collected in a little ball at the apex of a slender prolongation of the stem.

Along the stream side the most conspicuous hepatic is *Pellia epiphylla*, one of the thalloid species, the flat matted thallus of which covers square feet at a time of the bare clayey soil where the banks have been eroded by the stream. In early spring its dark globular fruits on their slender hyaline pedicels are very characteristic. Often found in similar situations is another thalloid hepatic, *Lunularia cruciata*, easily distinguished from the foregoing one by its shiny yellowish-green colour and crescent-shaped gemmæ cups on the fronds.

Submerged in the stream attached to stones at the bottom, will be found the water-moss, *Fontinalis antipyretica*, conspicuous by reason of its long trailing stems with their large, dark-green ‘ keeled ’ leaves. Also submerged is the hepatic *Scapania undulata*, the commonest species of the genus in the southern Pennines. It is identified by its bright green colour, and its lobed, ‘ keeled ’ leaves, the smaller lobe being folded in front of the larger, both lobes without teeth, and of a wavy appearance when dry.

There may be mentioned here the most ubiquitous hepatic of all, *Diplophyllum albicans*, which will be found in patches everywhere at high and low elevations. It bears a family resemblance to a *Scapania,* having front and back lobes to the leaves, but its chief distinction is that of being the only hepatic showing rudimentary traces of a nerve in its leaf. This will easily be seen with a lens as a white line running down the centre of the dark-green back lobe of the leaf.

On upright bare clay banks by the stream-side is likely to be found a representative of the genus *Fissidens, F. bryoides,* This family is characterised by having the leaves in two true rows on the stem, and not apparently so, *i.e.*, complanate, as in the family *Plagiothecium.* The largest member of this latter family, *P. undulatum,* may frequently be found hanging in masses among the grass, *Chrysosplenium,* etc., which grow in the runlets to the stream from the banks above.

A hepatic commonly met with in similar situations to the *Fissidens* is *Calypogeia trichomanis.* This is the commonest member of a genus which is distinguished by yellowish green balls of gemmæ on the tops of the stem, resembling in this respect the moss already referred to, *Aulacomnium androgynum.* Of course the plants are not similar in other ways, the *Aulacomnium* having true veined moss-leaves, and the *Calypogeia* having leaves in two rows with larger cells, with no veins and also underleaves, which can clearly be seen with a lens on the underside of the stem.

As one proceeds higher towards the moors with the trees only scattered, and the stream more rocky, one notices on the banks, where clay and stone intermingle, two other members of the *Polytrichum* family—the first one, *P. aloides,* about one-third the size of the *P. commune* already mentioned. It is chiefly noticeable for its widespread and persistent protonema, and for the peculiar pink colour of the capsules, which are usually present in quantity. The other moss is *Oligotrichum hercynicum.* This has the stiff opaque leaves of the family, but the leaves themselves are curved upwards at the tip, and are not straight as in the *Polytrichums.*

The rocks in the stream are covered with masses of *Scapania undulata,* and at the edges of the stream one is almost certain to find another *Scapania, S. dentata.* This is normally a rich reddish-purple colour, and the back lobe of the leaf is strongly dentate, the front lobe being without teeth. Another hepatic, very similar in colour and appearance, found in similar situations, is *Alicularia compressa,* easily known under the lens by its circular leaves, of which each pair are pressed together face to face.

Growing in masses on wet rocks by the stream-side will be found *Dicranella squarrosa.* This at first sight bears little resemblance to its relative, *D. heteromalla,* being of much larger size, and of a bright yellowish-green colour with squarrose leaves, by which it is easily recongised; with it will be seen

Philonotis fontana, a moss of which the general appearance is that of stiff upright stems, pale green colour, and with a somewhat ' matt ' look about the leaves, which can always be remembered when once seen. *Pellia epiphylla* will be found everywhere near the stream.

We have now arrived near the source of the stream on the bare moorland. Here, as may be expected, mosses are fewer. We are certain to find, however, two species of the genus *Campylopus*, *C. flexuosus* and *C. pyriformis*. The family characteristics are those of a very broad nerve, and auricles at the base of the leaves. All the members of the family have straight leaves tapering to very narrow points. In addition, *C. pyriformis* is very fragile, and is recognised in the field by the number of broken-off leaves lying on the tufts, which are very extensive in many places.

On the ground among heather roots are two hepatics, very common in such situations. The first, *Gymnocolea inflata*, is known by the bilobed leaves with rounded lobes, and the peg-top-like, fragile perianths at the tops of the stems. The second, *Lophozia floerkii*, has three-lobed leaves, and large underleaves, but a look of its own which easily distinguishes it from the *Lepidozia reptans* mentioned previously.

In concluding this brief account of the bryological flora of the southern Pennines, it must not be thought that the above list of mosses and hepatics exhausts even the common species which will be found by searching. Only those have been mentioned which are bound to compel notice.

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The Earlier Inhabitants of London, by **Prof. F. G. Parsons.** London : Cecil Palmer, 240 pp., 10/6 net. Many of our readers will remember the interesting address given by Prof. Parsons when he was President of the Anthropological Section of the British Association Meeting at Leeds last year. He has followed this up by an intensive survey of early London and its inhabitants, including Palæolithic and Neolithic Man ; The Beaker Folk and the Coming of Bronze ; Coming of the Celt ; Beginnings of London ; London under the Romans ; The Picts, Scots and Saxons, and, lastly, the Danes.

The Human Habitat, by **Ellsworth Huntington.** London : Chapman & Hall, xii.+293 pp., 15/- net. The publishers inform us that : ' From the Arctic with its Eskimos to the African deserts and its Ba-Kalahari, Ellsworth Huntington tells the story of mankind adapting itself to a hundred different homes. He describes vividly the nature of each geographical zone and the characteristics of the people who inhabit it. You will read intimate accounts of the lives of many peoples—some of them almost incredibly strange—the Bushmen, Pigmies, Hottentots, Eskimos, Siberians, and scores more. The boon of our changing seasons and the manner in which they have stimulated the progress of our civilization is here told. Then there is contrasted the unchanging climate of the Arctic or Tropics where the people are bound to primitive life by the influence of the constant heat or cold.' The whole work is an attempt to give the layman a true idea of human geography as interpreted by the American School of Geographers.

CUMBERLAND COLEOPTERA IN 1927.

F. H. DAY, F.E.S.

THE season of 1927 in Cumberland, from an entomological point of view, was again a poor one, although whenever the prevailing bad weather allowed collecting to be done, I invariably found something worth going for.

In my report for 1926 (*Naturalist*, 1927, pp. 111-113) I gave the recorded number of Cumberland beetles as 1816 species. To this number I can now add a further four, viz.:

1. *Quedius schatzmayri* Gridelli. This was brought forward as British by Mr. B. S. Williams (*E.M.M.*, 1927, p. 154) from specimens taken by him near St. Albans, and also in flood refuse sent to him by me from the banks of the River Petteril, near Carlisle. Subsequent careful examination of my series of *Q. semiæneus* Steph. (which it much resembles) showed that *schatzmayri* is not uncommon in Cumberland. I have specimens from the River Petteril, Orton and Kingmoor, taken in flood refuse, moss and on the wing.
2. *Bledius terebrans* Schiod. Two taken on the sandy margins of the River Kingwater, May 24th, 1926. The common black *Bledius* of our Cumberland streams is *subterraneus* Er., which, however, was absent on the spot where *terebrans* was captured.
3. *Monochamus sartor* F. I have two examples of this fine Longicorn, taken in Carlisle in imported timber.
4. *M. sutor* L. One specimen, also in imported timber. These two species are, of course, not indigenous, but these are their first occurrences in Cumberland.

A visit to Ashness Wood, near Keswick, early in April was spoiled by a blizzard, and the only captures were *Myrmedonia humeralis* Gr. near nests of the Wood Ant, *Cryptobium brevipenne* Rey., under stones, *Quedius picipes* Man., *Atheta islandica* Kr., *Tachyporus humerosus* Er., and *Stenus picipes* Steph., all in moss.

On April 15th I spent some time in the Broadfield plantations, where felling operations had been recently in progress. The trees were mostly pine and spruce, and the cut-off tops were piled in heaps in the clearings of the wood. The spruce tops proved to be the most productive, the ladybird *Adalia obliterata* L. being in great abundance, with a few exceptionally bright examples of *Mysia oblongoguttata* L., plenty of *Coccinella* 10-*punctata* L., and a few *A. bipunctata* L. The part of the wood I visited was in a sheltered position, and the afternoon fairly bright and warm, which accounted for the unusual activity these ladybirds displayed. Several Staphs. were on the wing, quite a nice capture being *Tachinus elongatus* Gyll., always a rare insect here. Dead rabbits harboured numerous common species of *Philonthus*, among which I picked out *puella* Nor., a species in my experience more usually associated with putrid fungi than carrion.

Fungi growing on old tree stumps was productive of *Bolitochara obliqua* Er.

The afternoon of Saturday, May 7th, was one of the few really fine, warm afternoons enjoyed during the whole of the season. I spent it in one of the deep valleys which penetrate into the Pennines—the Croglin—but in this exposed upland, probably as a result of the previous bad weather, there was remarkably little stirring among insects. Two specimens of *Philonthus longicornis* Steph., flying about near a waterfall, were a surprising capture, as hitherto I have mostly found it in garden refuse, but possibly the sudden burst of warmth, and the air currents, had drawn them into the hills from the level country below. In the less turbulent parts of the stream *Hydroporus borealis* Gyll. was the only insect at all abundant. It affected the bottom of sandy pools, a foot or two in depth, and unless in motion was practically invisible, its colour harmonizing perfectly with the sand.

Towards the end of May I spent some time on Burgh Marsh, mainly in search of water-bugs, and the few beetles collected were mostly familiar Solway species, such as *Bembidion æneum* Germ., *Haliplus apicalis* Th., *Laccobius minutus* L., *Atheta vestita* Gr., and *Telephorus darwinianus* Shp.

In June, at Orton, beetles of certain species were numerous, but I could find nothing new to me in that already well-worked locality. The large Skipjack, *Corymbites pectinicornis* L., for which Orton is famous, was common flying about in the sunshine. I netted, for examination, twenty-five specimens, all but one being males. The female is more usually found resting in bushes and long grass, but is always scarce. The beautiful *Polydrosus flavipes* De G., which I first found in this locality in 1919, was represented by a couple of specimens, knocked out of hazel. As I have pointed out elsewhere, this uncommon species is liable to be overlooked for the much more abundant *P. pterygomalis* Sch., although I do not think the two occur together, at any rate *flavipes* is the only one I have found at Orton. It has also occurred sparingly in the Nature Reserve at Kingmoor. By treading round the mossy edges of a pool *Gymnusa brevicollis* Pk. occurred, with an abundance of *Bembidion doris* Pz. and *Philonthus micans* Gr., and one or two *Philydrus fuscipennis* Th. By sweeping, the best capture was *Phyllotreta flexuosa* Ill.

A visit to the River Irthing, near Brampton, was disappointing, but it was interesting to find the very local *Bembidion schüppeli* Dj. still abundant in this, its original British locality.

Near Kirkbride, on the Solway, in the middle of June, I took *Bembidion varium* Ol., which I have not seen in Cumberland for many years. At the same time and place *Tachypus pallipes* Duft. and *T. flavipes* L. were both common on sandy mudflats, with various other allied species characteristic of this habitat. On these Solway marshes and mudflats one frequently meets with various weevils of the genus *Phyllobius*, doubtless brought down in floods from wooded districts. On this occasion I was pleased to capture a couple of specimens of *P. pomonæ* var. *cinereipennis* Gyll., which are the first Cumberland examples of this form I have seen.

In July, at Durdar, I took *Malthodes guttifer* Kies., females, by beating pine tops, new to me in this sex.

At Penton, on the River Liddell, which forms the boundary between Cumberland and Scotland, I met with several other species of this genus, viz., *dispar* Germ., *flavoguttatus* Kies., *minimus* L., and *pellucidus* Kies., the last named being particularly common. There are few records from this part of Cumberland, so mention may be made of *Podabrus alpinus* Pk., *Telephorus figuratus* Man., *bicolor* F. and *flavilabris* Fall., *Grammoptera tabacicolor* De G., *Helodes marginata* F., *Atheta cinnamoptera* Th., *Anisotoma dubia* Kug., *A. calcarata* Er., one very large ♂; all these were captured by general beating and sweeping. By the sides of the stream *Bledius subterraneus* Er. was noticed in numbers, and hiding under stones by the water's edge were many examples of the nocturnal whirligig *Orectochilus villosus* Müll. These Penton captures were all made on the Cumberland side of the boundary—certain species I took on the Scottish side have been recorded elsewhere.

I did little in August except to pay a visit to the sandhills at Drigg with the object of taking *Hippodamia variegata* Goez. It was apparently just emerging as several of those taken were rather soft. Nearly ninety per cent. of those captured and 'set' proved to be females. I found them sitting on the stems of marram grass, just at the point where the shelving sandhills meet the line of the beach. I could not find any elsewhere or in any other way. *Coccinella 11-punctata* L. was common, a fair number being of the form with the middle pair of elytral spots united (*confluens* Haw.). In 1926 I did not find any of this form; the form with the apical pair of spots united (*confluens* Donis.) was then common. This species is not so restricted in its distribution as *variegata*, and is to be found all over the sandhills; the pupæ are attached to the stems of the marram grass, as also are those of *C. 7-punctata* L., another abundant ladybird in this locality.

In October I had a turn at bark and fungi at Durdar. In the latter I got *Cis alni* Gyll, *Bolitochara lucida* Gr., with

Agaricochara laevicollis Kr. in plenty. Bark, mainly on pine logs, produced *Leptusa fumida* Er., *Omalium punctipenne* Th., and *Phlœocharis subtilissima* Man. in numbers, with odd specimens of *Ocyusa incrassata* Muls., *Phlœopora reptans* Gr. and *Atheta coriaria* Kr.

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ADDITIONS TO THE YORKSHIRE DIPTERA LIST.

CHRIS. A. CHEETHAM.

THE last supplementary list will be found on p. 143 of *The Naturalist* for 1927. The following have been identified or published since that was drawn up, almost one-third of them are from Allerthorpe, where much of the work of the section has been done this year.

Initials in brackets are those of the referee who has identified the particular insect, and we are again indebted to Messrs. J. E. Collin, F. W. Edwards and C. J. Wainwright for their assistance.

The list of Chironomus sps. is due to Mr. W. D. Hincks' paper, and that of the Tachinids to Mr. W. J. Fordham's collections.

Cordyla nitidula Edw. Allerthorpe, C.A.C.
Mycetophila signatoides Dz. Coxley, 25/6/25, C.A.C. (F.W.E.).
M. gibbula Edw. York, A. Beaumont (F.W.E.).
Anatella incisurata Edw. Cautley, 1/8/27, C.A.C.
Phronia forcipata Winn. Grass Woods, 4/6/27, C.A.C. (F.W.E.).
Boletina griphoides Edw. Grass Woods, 4/6/27, C.A.C. (F.W.E.).
Mycomyia ornata Mg. Grass Woods, 4/6/27, C.A.C. (F.W.E.).
Boletophila (*hybrida*?). Austwick, 15/6/23, C.A.C. (F.W.E.).
Macrocera parva Lundst. Grass Woods, 22/5/27, F.W.E.
M. stigmoides Edw. Thorner, 21/6/24, C.A.C. (F.W.E.).
Scatopse nigripennis Mg. Grass Woods, 22/5/27, F.W.E.
Corynoneura celeripes Winn. Bramhope, 22/5/27, F.W.E.
Chironomus plebius Mq. Ilkley, G. Grace.
C. blandus v. d. Wulp. Keighley, R. Butterfield.
C. zonarius Wlk. Keighley, R.B.
C. intexus Wlk. Keighley, R.B.
C. rosenscholdi Ztt. Eccup, W. D. Hincks.
C. obscuripes Mq. Ilkley, G.G.
C. longistylus Goet. Keighley, R.B.
C. thummi Kf. Leeds, W.D.H.
C. chlorolobus Kf. Eccup, W.D.H.
C. albofasciatus Staeg. Ilkley, G.G.
C. parilis Wlk. Farnley Park, G.G.
C. rufinatus Edw. m.s. Ilkley, G.G.
C. coracinum Ztt. Eccup, W.D.H.
C. pullus Ztt. Whernside, 20/6/24, F.W.E.
Cricotopus angustatus Goet. Bramhope, 22/5/27, F.W.E.
Camptocladius gracilis Goet. Addingham, 21/5/27, F.W.E.
C. exiguus Goet. Addingham, 21/5/27, F.W.E.
Tanypus (*pusillus* Mg.) *dubius* Mg. Bolton Woods, 22/5/27, F.W.E.
Tanytarsus c.f. *lestægi* Goet. Bramhope, 22/5/27, F.W.E.

Dicranomyia aquosa Verr. Cautley, 1/8/27, C.A.C. (F.W.E.).
D. aperta Wahl. Austwick, 2/9/27, C.A.C. (F.W.E.).
Orimarga virgo Ztt. Cautley, 1/8/27, C.A.C. (F.W.E.).
Gonomyia abbreviata Lw. Austwick, 17/9/27, C.A.C.
G. recta Tonn. Middleham, 29/7/26, C.A.C.
Erioptera macrophthalma Lw. Crag Wood, 9/7/25, C.A.C.
Molophilus murinus Mg. Austwick, 10/6/27, C.A.C.
Helobia hybrida Mg. (*Symplecta punctipennis*). Austwick, 17/9/27, C.A.C.
Ephelia apicata Lw. Cautley, 1/8/27, C.A.C.
Limnophila aperta Verr. Crag Wood, 6/9/27, C.A.C.
Ula macroptera Mcq. (*pilosa* Schum.). Crag Wood, 6/9/27, C.A.C.
Amalopsis claripennis Verr. Austwick, 24/9/27, C.A.C.
Rhamphomyia filata Ztt. Allerthorpe, 6/26, W.J.F.
R. geniculata Mg. (*plumipes* F.). Austwick, 10/6/27, C.A.C.
R. gallica Mg. Allerthorpe, W.J.F.
R. tarsata Mg. Grass Woods, 4/6/27, C.A.C. (J.E.C.).
Empis nuntia Mg. (pennaria of list). C.A.C. (J.E.C.).
Hilara niveipennis Ztt. C.A.C. (J.E.C.).
H. galacoptera Stbl. (Collin). C.A.C. (J.E.C.).
Tachydromia lutea Fln.' Buttercrambe, 6/27, W.D.H.
Dolichopus agilis Mg. Allerthorpe, 2/7/27, C.A.C. (J.E.C.).
D. laticola. The record on p. 361 (1927) is an error.
Sympycnus spiculatus Gerst. Cautley, 1/8/27, C.A.C. (J.E.C.).
Sciopus maritimus Licht. Allerthorpe, 2/7/27, C.A.C.
Pipunculus varipes Mg. Allerthorpe, 2/7/27, C.A.C.
P. semifumosus Kow. Allerthorpe, 2/7/27, C.A.C.
P. minimus Bkr. Allerthorpe, 2/7/27, C.A.C.
Syrphus punctulatus Verr. Allerthorpe, 14/4/26, W.J.F.
Sphærophoria flavicauda Ztt. Allerthorpe, 12/6/26, W.D.H.
Zenillia pexops B. & B. Allerthorpe, 6/26, W.J.F. (C.J.W.).
Gonia ornata Mg. Bubwith, W.J.F. (C.J.W.).
Lypha (*Aporomyia*) *dubia* Fln. Allerthorpe, 29/4/27, W.J.F. (C.J.W.).
Ptychomyia selecta Mg. Allerthorpe, 2/7/27, C.A.C.
Melinda gentilis Sch. Allerthorpe, W.J.F. (C.J.W.).
Onesia agilis Mg. Allerthorpe, 2/8/24, W.J.F. (C.J.W.).
Chortophila discreta Mg. Allerthorpe, 6/26, W.J.F.
C. intersecta Mg. Crag Wood, 19/7/26, C.A.C. (J.E.C.).
Mydæa calceata Rnd. Allerthorpe, 6/26, W.J.F.
M. atripes Mde. (*duplaris* Stein.). Bedale, C.A.C.
M. duplaris Ztt. Allerthorpe, W.J.F., C.A.C. We have both these sps. One has been recorded previously.
Pegomyia tenera Ztt. Allerthorpe, 18/6/21, W.J.F.
Hylemyia præpotens Wd. Allerthorpe, 2/7/27, C.A.C.
H. nuda Strbl. Pateley, 2/7/19, C.A.C. (J.E.C.).
H. coarctata Fln. Allerthorpe, ♀ W.J.F., 8/25, ♂ C.A.C., 3/7/27 (J.E.C.).
Cænosia tricolor Ztt. Allerthorpe, 2/7/27, C.A.C.
C. pygmæa Ztt. Cautley, 1/8/27, C.A.C.
Psila debilis Egg. Allerthorpe, 2/7/27, C.A.C. (J.E.C.).
Agromyza pygmæa Mg. Grass Woods, 4/6/27, C.A.C. (J.E.C.).
A. spirææ Kalt. Grass Woods, 4/6/27, C.A.C. (J.E.C.).
Sepsis flavimana Mq. (*ruficornis* Coll.). Cautley, 1/8/27, C.A.C.
Drosophila transversa Fln. Grass Woods, 4/6/27, C.A.C.
Collinella (*Limosina*) *cænosa* Rdi. Emley Pit, 16/2/27, B. Morley (J.E.C.)

Mr. B. Morley informs me that the Collinella swarms in this pit, and that the miners are much troubled with it; as soon as they bring out their food these little flies swarm all over it, causing them much inconvenience. In looking into the distribution of the insect, I found in *The Entomologist's Monthly Magazine* for June, 1913, p. 133, a note on this fly under the old name *Limosina cœnosa*. A Mr. G. Lees, of Oldham, Lancashire, stated that 'they were swarming in closets, causing great inconvenience to inhabitants' early in November, 1911. With this in view it would appear that an effort should be made to destroy them by dealing with their breeding places in the pits. There must certainly be grave risk of disease from their associations and their habit of getting on to the miners' food.

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FIELD NOTES.

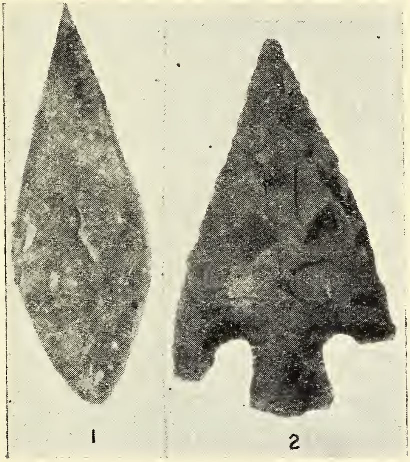
Sinistral Helix pomatia L.—This monstrosity seems to be very rare in England, only five records being given by Mr. J. W. Taylor, Monogr., III., p. 228. In the collection formed by the late Arthur Russell, I noticed a specimen from Gomshall, collected about 1868, which is now to be seen in the Schlesch collection at the Hull Museum.—HANS SCHLESCH.

Marsh Harrier in East Yorkshire.—A fine young Marsh Harrier in excellent plumage recently caught alive at North Newbald by Mr. Harrison-Broadley's gamekeeper, Mr. Hiscock, was sent to the Hull Museum on the kind suggestion of Mr. Buttle. It was altogether of different plumage from that of the Marsh Harrier already represented in the Museum collection, and will eventually be placed therein. In the meantime it has been sent to the Zoological Gardens, London, where it is apparently very welcome, and where it will be kept alive as long as possible.—T. SHEPPARD, Hull.

The Recent Invasion of Brama raii Bloch.—With reference to the note by Mr. W. J. Clarke in *The Naturalist* for April, 1928, p. 107-9, may I refer to Mr. O Nordgaard's paper entitled 'Notes on Fishes, III.' (*Det Kongelige Norske Videnskabers Selskabs Forhandlinger*, Bd. I., No. 23, 1928). According to this, *Brama raii* was found on November 15th, 1927, stranded, living, not far from the fishing place of Titran, on the south-western part of Frya, at Haavik, situated outside the Trondhjem Fjord, at 63° 40′ N. lat. Another specimen was caught alive on the coast of Sandnes (Jæren) in S.W. Norway, by a fisherman, in the last week of December, 1927, and brought to the Stavanger Museum. Besides these two records from Norway, *Brama raii* has only once before been found in Norway, probably near Bergen, and kept in the Bergen Museum. This was a long time ago. Very probably *Brama raii* may be found as far north as the Icelandic coast, as in

September, 1870, a single specimen of the related *Brama raschi* Esmark, which also has been recorded about 1860 from West Finmark, was driven ashore at the Vestmannæyer, S.W. Iceland (specimen kept in the Zoology Museum of Copenhagen).—HANS SCHLESCH, Copenhagen, April 12th, 1928.

Flint Implements from North Yorks.—In the course of 1927 two finely worked flint arrow-heads from Danby High Moor, near the dale head, came into my possession. No. 1, lozenge-shaped, late Neolithic, was found at 1200 feet O.D., near a water course flowing through the peat, out of which it had presumably been washed. No. 2, with barbs and tang, late Bronze Age,* was found by a peat cutter 3½ feet below the surface on the watershed between Danbydale and Rosedale (1300 feet O.D.). Mr. Reginald Smith has dated both specimens.—W. E. F. MACMILLAN.



An Introduction to Oceanography, by **James Johnstone.** London: Hodder & Stoughton, x.+368 pp., 15/- net. Dr. Johnstone's 'Oceanography,' originally reviewed in these columns (April, 1924, page 104), has quickly been reprinted, as we anticipated it would be, and the author has taken advantage of much recent work, resulting in a large proportion of the matter being revised and re-written. There are also more illustrations in the text.

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* The Mortimer collection from the wolds contains many hundred similar examples to this, picked up on the Yorkshire Wolds with thousands of other typical Neolithic implements, but in these cases there is no evidence in their being of 'late Bronze Age.'—Ed.

THE YORKSHIRE NATURALISTS' UNION'S ANNUAL REPORT

FOR 1927.

(*Continued from page 153*).

Bryological Committee (F. E. Milsom, B.Sc.) :—During the past year bryological work has been carried out at all the field meetings, and, in addition, special meetings have been held at Meltham and Bolton Abbey. Reports of these meetings will be found in *The Naturalist.* The following special points call for comment.

Dicranum undulatum has been found on Skipwith Common in a station twelve miles distant from its previously only recorded station in Yorkshire.

The range of *Orthodontium gracile* var. *heterocarpum* has been further extended during the year. This has been recorded, since its original discovery at Crowden, for Adel, Askern, Coxley Valley, Meltham, Penistone, Raikes Dyke and Ramsden Rocks (near Holmfirth), Shepley, so that it may now be taken for granted that it is widely distributed throughout South Yorkshire. The habitats range from heather moorland to the trunks and ground at the foot of trees.

It was mentioned in last year's report that little work had been done on the ecological aspect of bryology. Some work is now being carried out on the moss and hepatic associations in marshes, and it is hoped that a report on this will soon be issued. In conjunction with this work, the following two hepatics have been found on Helwith Moss, near Austwick (V.C. 64) :

Cephalozia macrostachya, first recorded for Yorkshire a few years ago from Austwick Moss.

C. loitlesbergeri, now recorded for Yorkshire for the first time.

In connexion with the bryological flora of marshes, it may be pointed out that further work is needed on the distribution of Sphagna in Yorkshire. Some areas have been well worked, notably Cronkley and Widdybank Fells by Messrs. Horrell and Jones, and the moorlands round York by the late W. Ingham, but much still remains to be done.

Mycological Committee (A. E. Peck) :—The Fungus Foray held at Stamford Bridge was quite a success, although, partly owing to the unsettled weather, the district was by no means completely explored. We had the advantage of the presence of Mr. A. A. Pearson, Foray Secretary of the British Mycological Society, already a member of the Y.N.U., and now added to its Mycological Committee. Your Recorder, Mr. F. A. Mason, has made headway in the reorganisation of the numerous mycological records for the county, and in the September number of *The Naturalist* published a list of the 'Phycomycetes of Yorkshire.'

Your Hon. Secretary has recently supplied to Mr. Mason, for incorporation with the County Records, a list of over two hundred species of fungi which have been added to the Scarborough list during his residence in this district from 1909 to 1927. This is exclusive of the records made during the two Y.N.U. Forays for 1915 and the Hackness Foray of 1925. Records for Scarborough prior to this period were by Geo. Massee.

Plant Galls Committee (W. Falconer, F.E.S.) :—The members interested in plant galls have been well represented numerically at the meetings held during the year, and have in consequence had a very successful season. The districts visited have been investigated for the first time, and the results obtained are therefore valuable as indicating where the various forms occur, and how they are distributed in the county. Amongst them were three specially rare galls which had not before been noted in Yorkshire. For the complete lists reference should be made to the reports (inclusive of the parasitic fungi) published in

The Naturalist : Middleham (Bank Holiday Meeting, 1926), January, p. 25, Mr. J. M. Brown ; Grass Woods, July, pp. 210-212 ; Allerthorpe Common (fungal galls), October, p. 307, Mr. F. A. Mason, and an article 'Plant Galls from East Yorkshire,' p. 337-340.

Committee of Suggestions (Chris. A. Cheetham) :—The pages of *The Naturalist* show that the work initiated by this Committee is in good hands. Perhaps least work has been done on the Peat Investigation, but here Dr. G. Erdtman, in his paper on 'Peat Deposits of the Cleveland Hills,' has published a valuable article on some able and interesting work.

The Rivers Investigation Sub-committee has continued its definite programme, thanks to the help of the grants made by the Royal Society and the Leeds Philosophical Society. In the October issue of *The Naturalist*, Mr. J. W. H. Johnson of this Committee criticises a 'Report on the River Wharfe' made by Dr. E. Jee. This was issued by the Ministry of Agriculture and Fisheries and the Standing Committee on Rivers Pollution (1921) Report, No. 110, Serial No. 147.

Messrs. Percival and Whitehead have also published reports on the fauna of the waters visited on the occasion of the Union's excursions.

Marine Biological Committee (E. Percival, B.Sc.) :—The main work of the year has been confined to an investigation of the shore at Stainton Dale, which was made during the meeting, April 16th-18th. Although the number of species was small, there was much of œcological interest owing to the formation of the shore. The beach consists of large rounded stones of from 1 ft. diameter upwards, presenting clear indications of much rolling owing to the heavy swell. There is very little sand, thus poor shelter for burrowing organisms. The rock haunting organisms were scanty in numbers and species. Presumably the rolling and grinding of the boulders prevents any development of algæ and barnacles, and this, no doubt, reacts on the herbivores such as *Littorina* and *Patella*, and the carnivores such as *Purpura* as they were few. Also the encrusting sponge, *Halichondria*, was scarce, and with it the sponge-eating nudibranch *Archidoris*. Correlated with the almost complete absence of Hydroids was the scarcity of *Æolis* which feeds on them. *Littorina littorea* was the scarcest of the species of *Littorina*, while *L. rudis* was most abundant, while *L. obtusata* was also common. Great numbers of *Mytilus edulis* up to 4 mm. length were present in small cracks and among patches of Corallina. Larger specimens were found only in places where there was stable shelter.

An interesting feature was the abundance of 'Glass-eels,' which occurred under boulders and in small pools of brackish water where the beck runs into the sea. These have been found every year, and presumably have recently arrived at this time. The most abundant organisms noted were the marine Triclad, *Procerodes ulvæ*, and an Amphipod, *Gammarus locusta* L., both of which were found in thousands under boulders, especially in the brackish region. At the foot of the north cliff were obtained numbers of *Ligia oceanica* and *Petrobius carpenteri* in company with the woodlouse, *Oniscus asellus* and *Lithobius forficatus*, the common centipede. In this spray zone was also *Orchestia littorea* Mont. The examination showed very clearly the effects of a heavy swell on a boulder strewn shore where life conditions are of the severest kind and shelter is almost at a minimum.

Microbiological Committee (E. Percival, B.Sc.) :—A meeting was held at Allerthorpe on July 2nd. A resolution was passed that the name of the committee be changed to Freshwater Biological Committee, so as to include all the organisms living in freshwater.

Work has been carried on, especially in the direction of the study of the fauna of rock faces wetted by thin streams, *i.e.*, the *Fauna Hygropetrica*. There are many such places, especially in the mountainous parts of the county, and an attempt is being made to compare the fauna with that determined in similar places on the continent. More workers are needed on this committee.

Geological Photographs Committee.—The Secretary, Major A. J. Stather, reports that during the year a number of interesting prints of geological interest have been added to the Yorkshire Naturalists' Union albums of geological photographs.

Coast Erosion.—Naturally, as a result of the exceptional wet summer and somewhat stormy weather, the erosion on the Holderness Coast has been rather pronounced than normal, but we have no reason for assuming that, in say ten years, the average will be more than has been the case since we began taking records. The Bridlington Corporation is endeavouring to stay the erosion of the cliffs between the Promenade and Sewerby by scarping the cliffs and attempting to plant trees.

Glacial Committee.—In East Yorkshire particularly the Committee has done excellent work during the past twelve months in describing new sections and in recording additional mammalian remains in old sections. Possibly due to the energetic way in which building operations are being carried out, sections are larger and more numerous than any of the members can recollect. At Paull two sections have been opened out ; at Brandesburton the Barfe has disappeared, but other important sections have been opened : and Gravel Pits at other places have been excavated. These have been described in *The Naturalist* (March, p. 92), and in the recently published volume of the Transactions of the Hull Geological Society.

As pointed out in another paragraph, the wonderful recent and glacial beds along the Sewerby cliff have been entirely covered and spoilt from a geological point of view. The Bridlington Corporation has cut these into a straight slope, which has the charm of a railway embankment, and has covered many of them up by tipping stone, etc., from the cliff top. In addition, vegetation has been planted over part of the area, and possibly will be extended if successful, so that the Sewerby Gravels are not likely to be visible for future generations of geologists unless artificial sections are made inland.

Among the mammalian remains found in the gravels during the year are those of mammoth, rhinoceros, horse, seal and bison.
Possibly due to deeper excavations now made mammalian remains seem more plentiful than usual, and recent finds show tremendous preponderance of bones and horn cores of *Bos primigenius*. Photographs of recent sections in the gravels have been forwarded to the Geological Photographs Committee.

BALANCE SHEET, November 19, 1927.

LIABILITIES.

	£	s.	d.
Amounts owing by Union—			
'Naturalist,' etc.	100	2	4
Subscriptions paid in advance ...	10	15	0
Life Members' A/c	150	9	0
'Hey' Legacy A/c	20	0	0
Levy paid in advance	0	2	6
Balance, being excess of Assets over Liabilities	241	5	0
	£522	13	10

ASSETS.

	£	s.	d.	£	s.	d.
Cash in Bank				330	11	0
Cash in hands of Hon. Secretaries ...				0	1	2
,, ,, Hon. Treasurer ...				2	2	9
,, ,, Hon. Editor... ...				3	10	2
War Savings Certificates, £125 present value say...				163	8	9
Subscriptions in arrears,	£41	16	2			
Written off as unrealisable	18	16	2			
				23	0	0
Investments :—						
'Cheesman Fund,' £100 5% War Loan.						
'Booth Fund,' £100 3½% Conversion Loan.						
				£522	13	10

Audited and found correct,
Nov. 24th, 1927,

CHRIS. A. CHEETHAM, } *Hon. Auditors.*
W. H. BURRELL, }

STATEMENT OF INCOME AND EXPENDITURE.

12 months to November 19, 1927.

INCOME.

	£	s.	d.	£	s.	d.
Members' Annual						
Subscriptions, arrears	14	6	0			
,, 1927	101	5	3			
,, 1928	4	16	0			
				120	7	3
Levies from Associated						
Societies, arrears	2	12	0			
,, 1927	12	10	0			
,, 1928	0	2	6			
				15	4	6
'Booth' Fund for printing				3	10	0
Bank Interest				4	5	7
'NATURALIST' :—	£	s.	d.			
Subscriptions, arrears	17	8	6			
,, 1927	127	18	6			
,, 1928	5	19	0			
				151	6	0
'Cheesman' Fund for illustrations ...				5	0	0
Actual Income for year 1927 -	£250	3	9			
,, Expenditure for year 1927	259	9	1			
				£299	13	4

The Expenses of Sedbergh Meeting, and all Clerical, Postal, Telephone, Telegraph and other incidental Expenses of Hon. Secretaries have been defrayed privately.

EXPENDITURE.

	£	s.	d.	£	s.	d.
Expenses of Meetings				4	7	0
Printing and Stationery (General A/c)				40	14	11
Postages, Addressing, etc.				11	7	8
,, (Hon. Treasurer's A/c)				0	17	6
Postages, etc. ,, ,,				1	6	7
Cost of Wreaths				2	1	0
'NATURALIST' :—						
Members' Copies ...	171	5	0			
Exchanges	5	12	6			
Binding	1	5	6			
Hon. Editor's Postages...	7	13	5			
Stationery	3	9	6			
Extra Illustrations ...	9	8	6			
				198	14	5
Balance, being Excess of Income over Expenditure				40	4	3
				£299	13	4

S. D. PERSY FISHER,
Hon. Treasurer.

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The Story of Myths, by **E. E. Kellett.** London : Kegan Paul, Trench Trubner & Co., Ltd., 275 pp., 7/6 net. These chapters were originally the lectures given to students at a Training College, and they are now printed in permanent form and make exceedingly interesting reading. The study of Mythology has extended considerably in recent years and a knowledge of the subject will do much to elucidate many problems met with by the student in several walks of life. The author begins with an excellent History of Folk-lore, and then deals with Psychological Elements in the Growth of Myth ; Still existing relics of Old Customs and Myth ; Myths of the Heavenly Bodies ; Sky and Sea, Due to Great Catastrophes ; to Invention and Discovery ; Birth and Death ; Mind ; Myths of Various Origin ; Creation and Twin Myths.

The Protection of Woodlands, by **G. W. St. Clair Thompson.** London : H. F. & G. Witherby, 223 pp., 10/6 net. Now that increased attention is being paid to the scientific growth of woodlands, particularly since the devastations created during the war, it is more than ever necessary that attention should be paid not only to the trees themselves, but to the various animal and plant enemies which have caused such havoc among them in the past. After dealing with the Choice of Species, Pure and Mixed Woods, Economic Woodlands, etc., the author refers to the Origin and General Control of Pests. His second chapter deals with Forest Birds, where the work of Dr. W. E. Collinge, and Von Vietinghoff, have been of service. The third chapter refers to various animals, and includes numerous species from the deer down to quite small forms ; and finally he mentions Silvicultural, Biological and Artificial Control ; Forestry and Game Preservation ; Forestry and Agriculture. There are Appendices giving lists of Trees, Insects, Birds, etc.

NEWS FROM THE MAGAZINES.

J. H. Orton describes 'The Dominant Species of Ostrea,' in *Nature*, No. 3044.

'Increasing Scarcity of the Landrail,' by Oliver H. Wild, appears in *The Scottish Naturalist*, No. 169.

Sir Daniel Hall writes on the Economic Position of Agriculture in *The Journal of the Ministry of Agriculture* for May.

A report of a lecture on 'The Birds of Shetland and the Isle of Man,' by T. A. Coward, occurs in *The Journal of the Manx Museum*, for March.

The Colliery Guardian for April 13th contains an abstract of a paper by J. T. Stobbs describing boulders found in various coal seams in England.

Edith R. Saunders gives some interesting 'Illustrations of Carpel Polymorphism'; and Gladys L. Naylor writes on 'Free-growing Fucoids' in *The New Phytologist* for April.

In *The Fishing Gazette* for April 14th, Mr. A. Fraser Brunner has a paper on Mackerel-like Fishes, in which he figures and describes Scribbled Mackerel (*Scomber scombrus* var. *scripta*); Spotted Mackerel (*Scomber scombrus* var. *punctata*); Spanish Mackerel (*Scomber colias*); Tunny, or Tuna (*Thunnus thynnus*); Pelamid and Belted Bonito (*Sarda sarda*) and Bonito (*Euthynnus pelamys*).

The Natural History Magazine, No. 5, issued by the British Museum (Natural History) contains a valuable record of the Stranded Whales at Dornoch Firth, by M. A. C. Hinton, with illustrations; a Book belonging to Lady Hamilton, by C. Davies Sherborn; an Interesting Botanical Wood-cut (made by Worthington G. Smith), by J. Ramsbottom; and a portrait of Dr. G. T. Prior, who has recently retired from the Keepership of Mineralogy.

We learn from *The North Western Naturalist* that Dr. W. E. Collinge has joined the 'Editorial body' of that journal. Doubtless this accounts for two short York notes in that journal. Notwithstanding all this help, '*sustaining subscribers*' are urgently required. 'Those responsible for the conduct and policy of *The North Western Naturalist* have given generously of their time and effort and their services have been entirely gratuitous.' This can be said of most similar publications.

——:o:——

NORTHERN NEWS.

We are glad to find, from the syllabus sent to us, that the Halifax Scientific Society is keeping up its reputation for sound work in the field as well as in the lecture room.

Reprinted from the *Transactions of the British Mycological Society*, Vol. XII., we have received from our contributor, Mr. T. Petch, the following: Studies on Entomogenous Fungi. *Peziotrichum lachnella*, *Ophionextria coccorum*, *Volutella epicoccum*; Glenospora; and *Septobasidium rameale*.

At a recent meeting of the Linnean Society, Dr. Malcolm Wilson read a paper by Miss M. J. F. Wilson and himself on 'The Dutch Elm Disease and its Occurrence in England,' illustrated by lantern slides. Professor F. O. Bower, F.R.S., read a paper on 'The Size-Factor in Plant Morphology, with Special Reference to the Stele,' also illustrated by lantern slides.

The British Museum (Natural History) has issued two pamphlets, each containing five beautifully coloured plates by F. W. Frohawk. One is entitled 'Life History of British Butterflies,' and illustrates the Swallow-tail, Large White, Silver-washed Fritillary, Peacock, and Marbled White Butterflies. The other deals with 'Life History of British Moths,' and describes Oak Eggar, Poplar Hawk-moth, Swallow-tailed Moth, Puss Moth, and Buff-tip. In addition, each pamphlet has descriptive letterpress, and is sold at one shilling.

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NOTICE.

Y.N.U. CONCHOLOGICAL SECTION.

A Meeting of the above Section, in conjunction wfth the Yorkshire Conchological Society and the Doncaster Scientific Society, will be held on July, 14th. Meet at Little Smeaton, Nr. Doncaster, at 3 p.m. Leaders: Mrs. E. Morehouse and Mr. T. W. Saunders, F.G.S.

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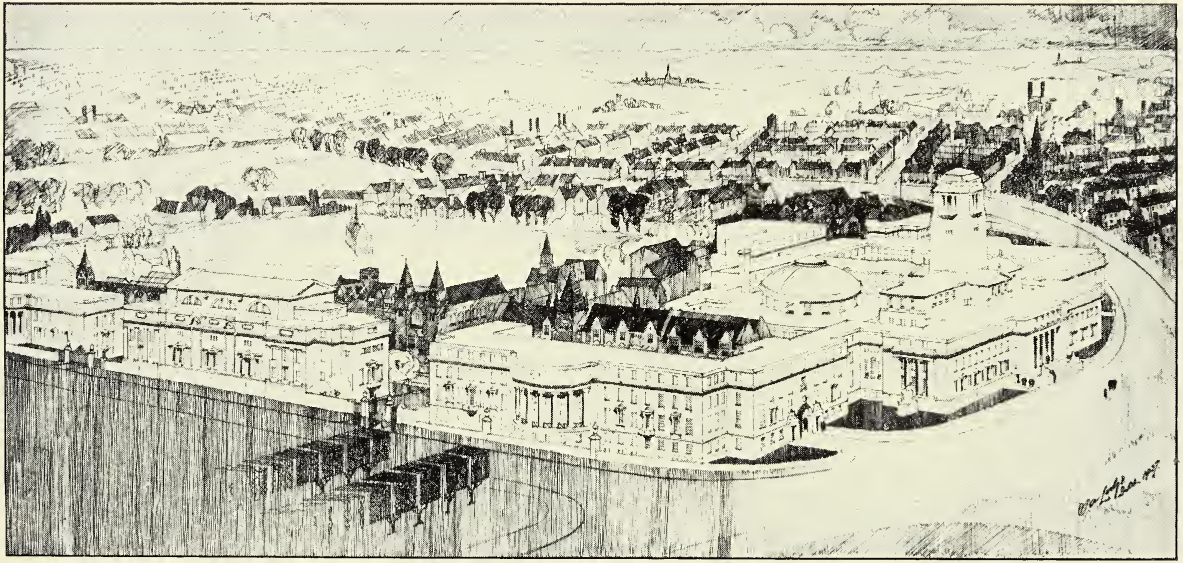

BIRD'S-EYE VIEW OF PROPOSED NEW BUILDINGS, LEEDS UNIVERSITY.

NOTES AND COMMENTS.

The Twenty-third Report of the University of Leeds, recently received, contains as frontispiece a Bird's-eye view of the proposed new buildings. This admirable scheme we are permitted to reproduce for the benefit of our readers. May some of them live to see it carried out.

DERBYSHIRE VOLCANICS.

At a recent meeting of the Geological Society of London, Mr. S. I. Tomkeieff read a paper on 'The Volcanic Complex of Calton Hill (Derbyshire).' He stated that : 'The volcanic complex of Calton Hill shows two phases of vulcanicity : (1) Effusive phase—represented by, besides the agglomerate and tuff of the old volcanic cone, a highly decomposed lava. Petrologically and chemically it is comparable with the other contemporaneous Lower Carboniferous lavas of the district. The vesicles are filled up with a chlorite of delessite type. (2) Instrusive phase—represented by a fresh analcite-basalt, which has intruded into the old volcanic chimney and spread amœba-like in the volcanic cone, detaching large masses of vesicular lava. Besides abundant analcite, mostly in the form of spheroids, the basalt contains numerous inclusions of peridotite. These inclusions, apparently shattered fragments of a pre-existing rock, contain, besides the normal pyroxene, a definite hydrous augite.

THE MERSEY TUNNEL.

To the same Society, Professor P. G. H. Boswell gave a lecture on the Geological Features of the New Mersey Tunnel. He said that the recent 'holing-through' of the highway-tunnel under the River Mersey, by which connexion was established between Liverpool and Birkenhead, makes the present time appropriate for giving an account of the features of geological interest which were revealed. The tunnel will be the greatest subaqueous tunnel in existence. The predictions of T. M. Reade regarding the existence of a buried channel beneath the River Mersey, and of G. H. Morton of a sub-Mersey fault, were verified in the driving of the Mersey Railway-Tunnel about fifty years ago. Subsequent records by local geologists have enabled greater precision to be given to the inferences, and the geological observations made during the operations now proceeding are, in the main, in accord with expectation. The subaqueous portion of the tunnel (44 feet in diameter) and the two Birkenhead approach-tunnels lie in the Middle Bunter Sandstone ('Pebble-Beds'), which dips eastwards at about 3° to 5°. A fault-system, apparently of small aggregate throw, was met with at about

1828 to 1870 feet from the Liverpool shaft. The hade was eastwards, whereas in the case of the sub-river fault in the Mersey Railway-Tunnel it was westwards. On the Liverpool side, the presence of the 'Castle Street Fault,' which throws down the Upper (Soft) Bunter Sandstone on the east, was confirmed. At the Old Haymarket entrance another north-north-west and south-south-east fault throws eastwards, and brings Lower Keuper Sandstone into contact with Upper Bunter. From observations in the area of the docks and the environs of Liverpool, and the numerous exploratory borings carried out in connexion with the tunnel-works, it has been possible to construct exceptionally accurate profiles of the system of buried channels. They appear to be of subglacial origin, and do not deepen seawards; they are filled with gravel and sand, overlaid by boulder-clay. In place of the single channel found in the Mersey Railway excavations, two (or more) feeding-channels occur farther north.

SIX HUNDRED MILLION YEARS.

We find in *The Daily Mail* for June 7th that 'Sir Edgeworth David, Professor of Geology at Sydney University, and the greatest living authority in Australian geology, announces the discovery in the rocks of Mount Lofty and of the Flinders Range, in South Australia, of perfectly preserved remains of animal life, estimated to be six hundred million years old.' Notwithstanding the reputation our contemporary has for accuracy, we don't believe it.

SPIDER CRAB—UNCOMMON SHELLFISH SPECIMEN SOLD AT FLEETWOOD.

Under the above heading, *The Yorkshire Post* for June 8th informs us that: 'A *queer looking** specimen of the *shellfish family*, and one which is seldom seen on the West Coast, was landed at Fleetwood yesterday by the steam trawler *Merisia*. It was a spider crab, which lives *under coral* on the bottom of the sea, and rarely emerges from its natural surroundings. The *fish*, which measured nearly three feet from tip to tip of claws, was purchased by an Accrington fish merchant, who will exhibit it. It is reputed to be one of the *ugliest of the denizens of the deep, and is usually preserved in a block of solid ice*. The Fleetwood fishing steamer, *Cymrea*, also landed a rare fish yesterday, known as a stone bass, which was netted off St. Kilda, in waters which have a rocky bed.

BRITISH SEA ANEMONES.

The Ray Society continues to place students under a debt of gratitude for its monographs, the most recent volume dealing with 'The British Sea Anemones,' by T. A. Stephenson, of the University College of London.* By the aid of beautifully coloured plates and illustrations in the text this difficult branch of Zoology is admirably dealt with. Hitherto, nothing of particular importance has been published on the subject since Gosse's monograph, issued so long ago as 1860. Dr. Stephenson deals with Structure, Coloration, Development, Bionomics, Classification, and then gives a list of the British Actiniaria. There are also copious references to the literature on the subject, the bibliography occupying quite a large number of pages. Among the illustrations are some tail pieces which were quite unexpected in the usually stern pages of the Ray Society's publications.

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* The italics are ours.—Ed.

MATRICULATION BOTANY.†

Miss Johnstone tells us in the preface that 'This book has been designed to meet the needs of students preparing for examinations of matriculation standard. The range of study adopted in such preparation is taken as being liberal, going beyond the bare requirements of the examination syllabus. Certain chapters lay the foundation for Higher Certificate work. The arrangement of the subject-matter is governed by two fundamental ideas. First, to a large extent general knowledge of plant life is considered to be best acquired through the detailed study of the life-histories of a few specially selected plants ; this entails first-hand continued observation of the living plant. Second, ecology, the investigations of plants in relation to their environment, is not reserved for late and detached consideration ; it is treated as an integral part of plant study from the beginning. It may be difficult to realise these aims in some schools ; but the necessary effort will be well repaid. For the town school, the difficulties of outdoor work are undoubtedly great, but the town child's need for it is also great. Every chance of a day with nature must be taken advantage of, the communal spirit which prompts the more favourably placed child to bring in specimens and records of observations for its class-mates should be fostered, whilst one well-planned week in a country camp will accomplish wonders in stimulation and in demonstration of right methods of approach to botanical study.' Fewer people are more qualified to prepare a book of this sort than Miss Johnstone, and it has been carried out in her usual thorough manner, illustrated by over 120 blocks.

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* British Museum (Natural History), Cromwell Road, S.W. 7., xii. +148 pp., 37/6 net.

† By Mary A. Johnstone. London : J. M. Dent & Sons, xii. +324 pp., 4/6 net.

1928 July 1

PLANT ECOLOGY.*

The sub-title of this book, namely 'The Distribution of Vegetation in the British Isles, arranged on a Geological Basis,' defines its scope. Fortunately, the writer has a thorough grasp of the geological features in addition to her botanical knowledge, which enables the book to be written with more than usual authority. Here again the pleasant style, the simplicity of the language and the beauty and choice of illustrations make the volume a pleasure to peruse.

FALSE KILLER-WHALES.

At a recent meeting of the Linnean Society, Mr. M. A. C. Hinton gave an account of the stranding of a school of False Killer-Whales (*Pseudorca crassidens*) in the Dornoch Firth on the 18th October, 1927, and of an expedition which he made with Mr. P. Stammwitz and Mr. J. L. Chaworth-Musters in order to study the whales and collect material for the British Museum. The species was first described from fossil remains from the Lincolnshire Fens by Owen in 1846, and first recognised as a living form by Reinhardt in 1862. Although traces of the species have been found in many parts of the world, our information about its external characters has been very meagre. The school which entered the Dornoch Firth was a large one ; the Museum party actually dealt with 145 individuals. In all probability others were stranded at the same time, but the carcases were swept into deep water by the tide and lost. Owing chiefly to tidal action the party had to deal with a chain of dead whales extending from the mouth of the Firth to the head of the Kyle of Sutherland, a distance of about thirty miles. Most of the whales were carefully measured, their stomach-contents examined, and parasites, internal and external, collected ; practically all the females were dissected for information as to breeding. With the help of local labour the whales were flensed, and the skeletons prepared and despatched to the Museum. Two individuals, a full-grown bull and a large cow, were sent entire to London, where plaster-casts were made from them. Numerous dissections have been made and 143 skeletons collected and cleaned. It is believed that when this material is worked out it will throw much light upon various problems connected with the breeding, rate of growth, and longevity of whales, which still await solution.

RARE FISHES IN THE NORTH SEA.

Under this heading Mr. E. Ehrenbaum, of Hamburg, has an interesting note in *Nature* (No. 3053), from which the following is an extract: 'Among these recent visitors has been a number of sharks, of more or less uncommon species. The Thresher Shark (Alopias) is one of these; another, and a greater stranger, is the great Basking Shark of Atlantic waters (*Selache maxima*). Another stranger to the North Sea is the Six-gilled Shark (*Hexanchus* or *Notidanus griseus*, L.), which has its home in the Mediterranean and neighbouring parts of the Atlantic, but has of late occurred in our home waters in quite unusual abundance. It has been caught especially on the Viking Bank, to the westward of the deep Norwegian Channel, and in such numbers as to become of almost regular occurrence in the fish-markets of Germany, where these and other sharks are in demand for food, and fetch very good prices. Even more remarkable perhaps than these is a long succession of captures of Ray's Bream, a fish of remarkable and striking appearance, which up to very lately had been but seldom recorded from the North Sea. Of late it has been taken in the English Channel and on the Viking Bank; and specimens have been caught or cast ashore in a large number of places all along the east coast of Great Britain from Cromer to the Dornoch Firth. One was lately caught in a flounder net on the Swedish coast of the Ore Sound; and there is an earlier record so far east as the Pomeranian coast of the Baltic. In the past few months there have also been caught on the Viking Bank by German steam-trawlers, certain other very rare species, these being the Devil fish, the Black fish, the Snipe fish or Trumpet fish.

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* By Mary A. Johnstone. London : J. M. Dent & Sons, viii. + 185 pp., 5/- net.

CUCKOO.

In *The Yorkshire Evening Post* for May 25th, Mr. H. Crowther, of the City Museum, Leeds, writes: 'Mr. A. E. Pullan, Burley-in-Wharfedale, sends me the following notes: "Poking around in a small plantation this morning, the sudden flushing of a whitethroat from the ground just prevented me from stepping on the nest. Looking in, I found it contained six eggs. Further on in some marshy ground up rose an agitated snipe, but I failed to locate its nest. Whilst thus searching, a sudden clamour overhead was caused by a female cuckoo being chased by two males. One male eventually dropped out of the hunt owing to the threatening attitude of the other, and the pursuit continued until they disappeared beyond some trees. There was also the inevitable small bird in attendance. I judged it to be a meadow pipit." '

EPHEMEROPTERA AND PLECOPTERA.

In a paper published in *The Proceedings of the Leeds Philosophical Society*, Volume 1, Part VI., on 'Observations on the Ova and Oviposition of Certain Ephemeroptera and

Plecoptera,' by E. Percival and H. Whitehead, it is pointed out that 'It will be gathered from the foregoing account that the distribution of eggs is an orderly process in which several factors come into operation. Among these are the cohering water-soluble substance holding the unwetted eggs together, the solution of which leads to their separation, the adhesive substance which is the means of anchoring them, and the rate of fall of the egg or egg-mass which, acting against the flowing stream, is largely responsible for determining the region in which deposition will take place. The rate of flow of a stream can be modified with a consequent production of changes in the nature of the bed. These changes, both in current and in bed, would have a direct effect on the distribution of the eggs of Ephemeroptera and Plecoptera, and consequently on the ultimate population of these insects in the stream. These orders provide quite a substantial portion of the food of fish (a 10-inch trout contained over 1000 recognisable subimagines of *Ephemerella ignita*) so that changes affecting their numbers would, no doubt, be reflected on the nutrition of fish living in the vicinity.'

THE BLACK GATE MUSEUM, NEWCASTLE.

In *The Proceedings of the Society of Antiquaries of Newcastle-upon-Tyne* just to hand, we learn that 'We all know that the highest function of a museum such as ours, or, indeed, of any museum, is to stimulate enquiry and to afford instruction to enquirers, and that whatever interferes to obstruct this object is an evil that demands a remedy. We are not, therefore, surprised that one possessed of the wide experience of Sir Henry Miers, when he visited the Black Gate in the early months of last year, during the course of the official enquires he undertook on behalf of the Carnegie Trust, saw exactly what we ourselves have seen, and felt just what we ourselves have felt about the drawbacks that hamper us, and that handicap not merely the popularity of our museum, but constitute so serious a hindrance to the full utilisation of its educational advantages. "These learned societies which maintain museums," says Sir Henry, "rarely have sufficient funds for the upkeep of their buildings and collections. . . . Over forty have given up the struggle and have passed into the hands of municipalities." Commenting on this section of his subject Sir Henry quite truly says that ancient buildings like the Black Gate, and others he mentions, are usually unsuitable for museum purposes, without drastic structural alterations. But he is a kindly critic ; "he forgives all who knows all," and Sir Henry Miers well understands the difficulties that such societies as ours labour under, and has a world of sympathy for the honorary curators of such institutions who have much to do and little in the way of equipment to do it with.'

LINCOLNSHIRE WHALES.

In *Lincolnshire Notes and Queries for October*, just received, Mr. Alfred Welby has the following note in reference to whales in Lincolnshire:—'An inquiry directed by the King's writ was held by the Sheriff of Lincolnshire, and John de Yordeburgh, concerning whales cast on shore in 1317; they first met at Waynflet on the Tuesday before St. Boltolph—17th June—and found that a small whale had on Friday before Mid-Lent Sunday come ashore between the Wapentakes of Candleshoe and Skirbeck, that sailors of Norfolk had taken a great part, and loaded their boats therewith while at sea, and that after it came ashore Richard de Morlee, and many others (named) had taken away parts. Then they met at Spaldyng on Friday after St. Barnabas—11th June—there they learnt that on Monday after St. Peter's Chair—22nd February—a great whale had come ashore on the sands of Holbech in the geldable, that a great part had been taken away by Geoffrey Huttred and others, the remainder being carried by the tide to the sands of Toft in the Wapentake of Sirbeck. This remainder was pursued by the commissioners, and at Lambcoteholm, in the Wapentake of Kirketon, they heard on Thursday before June 17th, that the whale had been carried by the tide to the shore near Scraynggrange (? Crane or Scream end), in the Wapentake of Skirbeck, where Richard de Morlee and others (named) had carried away parts. Incidentally they had learnt at Spaldyng that a son of Robert de Hirneflete, and others had found on the sands of Holbech a chest with goods to the value of £20 which ought to belong to the King as a wreck. Cal: of Inquisitions, Miscellaneous II., No. 294. In 1331 the Sheriff and Coroners of Lincoln made enquiry on Monday after All Saint's—1st November—concerning a small whale that came upon the land of Sir William de Kyme at his manor of Croft, whereof his men took for his use to the value of 5 marks; the rest was thrown by the sea to the land of Ebulo Lestraunge of Skegness where his men took all the residue for his use to the value of 5 marks.'

WITCHCRAFT AT BRIGG, LINCOLNSHIRE.

The Yorkshire Post reports that: "Boring operations at Brigg for a new water supply have failed to yield water at a depth of 350 feet. In December the Council sought the services of a water diviner, and engaged a Grimsby firm to undertake boring operations to a depth of 350 feet, at a cost of nearly £500. The contractor has expressed the opinion that all possible water bearing strata have been passed, and agrees with the

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Council's engineer that there is little hope of finding water on the present site. The Council, however, have decided to call in another water diviner to advise whether or not water can be tapped at a still lower depth. The engineer has said that while water diviners are sometimes successful in indicating where water lies, they are unable to indicate at what depth it exists, and he considers the engaging of another water diviner for that particular purpose as useless expenditure. There is now a shortage of water in the town.

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In Memoriam.

W. HARRISON HUTTON.

1857-1928.

Many of our readers who have known W. Harrison Hutton for several years will be grieved to learn of his sudden and unexpected death, which occurred on April 12th at Leeds, his native place.

All his life he has taken a keen and active interest in natural history, and recently one object in removing to the outskirts of the city was that he might be among his treasures. He attended his first meeting of the Yorkshire Naturalists' Union at Boroughbridge over forty years ago, and, with the late W. Denison Roebuck, took a keen interest in the mollusca, an interest which he retained to the end. He did not confine himself to any one section, however, and had a good general knowledge of natural history in its various aspects. He had the collector's instinct and knew where and when to find rarities.

He was a member of the Society which formerly existed, known as the Practical Naturalists' Society, and in 1885 he helped to form a Leeds branch. At that time he contributed articles to the *Manuscript Magazine*, which was circulated among its members.

He also was a student of the Lepidoptera, Coleoptera and Bird Life, and for many years he kept a marine aquarium. He was an early member of the Yorkshire Numismatic Society, and frequently attended its meetings and took part in the discussions, was a keen collector of postage stamps and belonged to the Leeds Philatelic Society.

In 1925 he married Miss Westerman, who previously had been a President of the Leeds Naturalists' Club, and we feel sure that all our readers will extend their sympathy to his widow.—T.S.

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T. G. Davies has issued his *Report of H.M. Inspectors of Mines for the year* 1926 (2, *Northern Division*) (London: H.M. S. O., 42 pp., 1/-).

YORKSHIRE NATURALISTS IN CLEVELAND.

F. A. MASON, F.R.M.S., AND W. H. PEARSALL, D.Sc., F.L.S.

THE three hundred and thirty-ninth meeting of the Yorkshire Naturalists' Union was held at Broughton, near Stokesley, during the Easter weekend, April 7th to 9th. The members were favoured both by delightful weather, and also by the presence of the President, Professor F. O. Bower. Although the season was backward, most of the sections were represented. Saturday's proceedings varied between a moorland tramp to Black and Grain Becks, under the leadership of Messrs. H. C. Versey and T. Ashton Lofthouse, and a less strenuous ramble among the woods of the manor house, under the guidance of Mr. Postgate. This party had the opportunity of examining the interesting Norman church at Ingleby. In the evening, the President, in his own inimitable style, enlivened the proceedings by remniscences of famous Victorian biologists, and of the early days of botany in the Universities. At Mr. Lofthouses's invitation, a large party spent a pleasant (and in many cases profitable) Sunday morning in visiting and admiring his gardens, while in the afternoon a smaller group, led by the President, visited the Roseberry Topping plant bed. Monday was devoted to the Ayton district, Mr. M. Odling leading the geologists and Mr. M. L. Thompson the botanists and entomologists. At the general meeting in the evening, Mr. Greevz Fysher occupied the chair, and after the customary reports, cordial votes of thanks were awarded to the leaders of the excursions, and to the landowners, Lord de Lisle, Mrs. Hodgkins, J. J. Burton, Esq., and E. O. D. Emmerson, Esq., who had granted permission to visit their estates. Five new members were elected.

GEOLOGY (M. Odling) :—The party met at High Green, Great Ayton, half-way between Great Ayton and Newton-under-Roseberry. The Whinstone is obtained from the world-famous Cleveland Dyke, which is the longest dyke in the kingdom, if not the longest in the world.

A full description of the occurrence of, and the effect of the dyke on the parent rock was given, and the peculiar break near Ayton was explained by means of a model based on Mr. King's account in the *Proceedings of the Leeds Geological Association.* Mr. Odling suggested that the dyke lay along a small or incipient fault. The whinstone, to use the local term, has in the past been largely worked for road metal, but its use has recently been largely superseded by slag, as with the advent of tar-macadam, slag has been more generally used since, probably owing to its greater porosity, slag will take tar better than whinstone.

The extent to which the whinstone has been worked was clearly visible by the deep cutting and spoil heaps all along the hill side ; and the track of the dyke towards Nunthorpe was clearly visibly as forming relatively higher ground ; the dyke and associated baked shale being less effected by denudation than the ordinary Liassic shales.

The geologists proceeded towards Newton-under-Roseberry. From the railway bridge, near Newton, the spoil heaps from the loading station from Roseberry and Ayton Banks Mines were visible ; and consist for the most part of shale and what is locally known as ' Sulphur,' that is ironstone containing large quantities of sulphide of iron, apparently occurring in two forms, as Marcasite and as Pyrites. The decomposition of these spoil heaps has, from time to time, more especially after heavy rains, when the field and other drains have been unable to cope with the water, caused considerable damage to cattle and to vegetation by the deposition of a flocculent precipitate of hydrated alumina, together with some bog iron ore.

The geological party climbed Roseberry Topping, the name of which appeared to be a misnomer, but was explained by reference to Mr. J. J. Burton's paper in the *Report of the Cleveland Naturalists' Field Club,* where is a list of names dating back as far as 1119 is given.

The cause of the landslip of 1912-13 was explained as being chiefly due to natural causes, and not to the effect of the ironstone workings as was popularly supposed.

The most remarkable fossil plant bed, which was exposed as a result of the landslip, was not found, having been covered up by down wash during the last winter; fragments, however (not in situ), were seen. After climbing to the top of Roseberry (1057 feet) a descent was made down the southern slope. The adits to Roseberry Mines were visited and an account of the Cleveland Ironstone was given, together with analyses. The decay in the use of this stone is chiefly due to the cost of mining it as compared with the open workings in Northamptonshire, and not to any inherent defect in the stone itself. Finally, the gravel pits at Rye Hill, composed almost entirely of materials from the Cheviots, and to a lesser extent from the Lake District, were examined, but the party was not fortunate in finding any shells. Ald. Stanley Sadler (Pres., Clev. Nat. Field Club) was present, and, as usual, was the life of the party; his jokes greatly lightening the stiff climb up Roseberry.

MOLLUSCA (Greevz Fysher):—The student of mollusca found the season a little inclement as the drought at Easter made it very difficult to observe any movements of terrestrial mollusca.

Mr. Percival reports observing *Anodonta cygnea* in the River Leven, and the following species have been identified by Mr. John W. Taylor.

From stream side, Broughton: *Ancylus fluviatilus.*

Roseberry Topping: *Hyalinia alliaria* and *H. pyramidula*, small races, *Zonitoides nitidus, Hyalinia nitidulus* and *H. crystallinus.*

Ingleby Greenhow: *Clausilia bidentata, Hyalinia crystallina, Pyramidula rotundata, Arion ater,* juv. *Arion hortensis, Limax maximus.*

Ingleby Greenhow Manor: *Agriolimax agrestis, L. maximus* and *L. lævis.*

Pond, Ingleby Greenhow: *Pisidium subtruncatum, P. Milium* and *P. pusillum.*

ENTOMOLOGY (J. M. Brown):—The Small Tortoiseshell was the only butterfly noticed. Bees were not in evidence, though numbers made their appearance later in the week. There were a few active Stoneflies and Mayflies in the neighbourhood of Ingleby, and an occasional Ichneumon fly and Sawfly was disturbed in hibernation under loose bark. One Brown Lacewing (*Hemerobius stigma*) was beaten from a Scots Fir on Easby Moor. Only ground—and subcortical—insects, such as beetles and springtails, were at all common.

Three species of ants, *Myrmica ruginodis, Donisthorpea flava,* and *Formica fusca* were noted.

Very few Hemiptera were seen. *Trapezonotus arenarius* occurred near Great Ayton, *Anthocoris nemorum* and *A. confusus* near Ingleby, *Corixa nigrolineata* and *C. præusta* in pools on Burton Head, and *Velia currens* on Easby Moor. The Scale-insect, *Orthezia cataphracta* was taken in moss on Urra Moor, and *Cryptococcus fagi* was on Beech.

Of Collembola, *Onychiurus armatus* and *O. fimetarius* were common under stones, *Neanura muscorum, Isotoma sensibilis, I. arborea,* and *Tomocerus minor* under bark, *Lepidocyrtus lanuginosus, Isotoma viridis* and *Dicyrtomina minuta* under fallen branches, *Entomobrya nivalis* and *E. albocincta* on tree trunks, while *Isotomina palustris* and *Agrenia bidenticulata* occurred on the margins of Black Beck. *Campodea staphylinus* was plentiful under stones.

Several species of the Pseudoscorpion, *Obisium muscorum* and of the Phalangid, *Nemastoma lugubre,* were obtained.

The only unusual plant galls noticed were caused by *Cynips kollari, Andricus fecundator, A. curvator* and *Biorrhiza pallida* on oak, *Rhabdophaga salicis* on sallow, and early stages of those caused by *Trioza galii* on *Galium,* and of *Psylla buxi* on Box. 'Witches' Brooms' were particularly plentiful on various trees.

COLEOPTERA (Mr. M. L. Thompson) :—Over fifty species of coleoptera were met with by Mr. J. M. Brown and myself. The following were recorded :—*Bradycallus collaris* Payk. (Easby Moor), *Agonum gracile* Gyll. (in sphagnum on Urra Moor), *Encephalus complicans* West. (Lonsdale), *Philonthus ebeninus* Grav. (Urra Moor), *Lathrimæum atrocephalum* Gyll. (Ingleby), *Aphodius boreale* Gyll. (Easby and Urra Moor), *Myelophilus piniperda* L. (Ingleby), and *Meloē proscarabæus* L. (Lonsdale).

VERTEBRATE ZOOLOGY (W. G. Bramley) :—The commoner finches were fairly abundant and singing freely during the bursts of sunshine. Curlews, Golden Plover, Woodcock and Snipe were also noted. Lapwings were fairly evenly, but thinly distributed in Bilsdale. Mr. Percival noted the Dipper at Hutton Rudby.

Among mammals the Water Vole was seen in Bilsdale, and evidence of its presence was noticed in Black Beck; the Pipistrelle Bat was fairly plentiful in the locality.

The only fishes seen were a few small Trout, and a small example of the Bullhead. Mr. Percival noted the Stone Loach. The absence of a more extensive fish fauna appears to be due to a paucity of food in the various becks.

A Viper was noted in the Black Beck area.

BOTANY (W. H. Pearsall) :—Although it was too early for work among flowering plants, botanists found much of interest. The Park plantation, visited on Saturday, was originally woodland of the Oak-Pteridium type, though now planted with Conifers and Beech and also containing a good deal of Elm. The principal feature was the effect of grazing by rabbits, shown not only by definite lair societies, spreading downward from the paths and consisting chiefly of *Agrostis vulgaris* and *Hylocomium squarrosum*, but also by the numerous trees showing signs of rabbit feeding and by the absence of seedlings. The trees attacked were mostly Elm, though occasionally Oaks. Rabbits had evidently gnawned the bark and exposed wood. A callus had formed round the wound, and this again had been nibbled at the edges. In this way the base of the trunk had extended into a flattened mass, two or three times the width of the normal trunk, but only half its thickness, and showing all the successive additions to the wood. Some of the trees showed up to forty ' rings ' in this way, and seems to be clear evidence that the rabbit attacks had been going on for at least forty years. In many cases the trees had fallen as the base of the trunk was too weak to maintain the increasing weight above. The effect of rabbits on tree bark is decidedly unusual, though it is sometimes observed during hard winters, principally on Beech. I have never previously seen indications of this on such an extensive and apparently continuous scale.

The woods round the base of Roseberry Topping are also much planted. The soil appears to be more clayey in character. Societies of *Mercurialis* and *Luzula maxima* were noted, but considerable areas of the woods had apparently been partly grazed, and in these, *Agrostis alba* and *A. vulgaris* were abundant, with *Oxalis, Holcus mollis* and *Mnium hornum* as the most constant associates. Some well-marked Ash streaks were seen where the drainage tended to accumulate.

Visits to the fossil plant-beds on Roseberry Topping resulted in the collection of a number of very characteristic impressions, although the main bed was not unearthed.

FRESHWATER BIOLOGY (E. Percival) :—The fauna of the following streams was examined :—Bilsdale Beck, Black Beck, Grain Beck, Baysdale Beck, River Leven, from hillside above Carlton to Yarm.

The first four streams showed a general similarity in fauna in that near their sources the species were few and consisted mainly of the aquatic stages of Plecoptera and Ephemeroptera. In passing to lower levels with an increase in deposition of sand, an increasing number of species of larvæ of Trichoptera and Diptera was noticed.

Black and Grain Becks proved different from any previously noticed in in that they carried a great development of the Livewort *Scapania undulata*, which did not appear to afford any very suitable shelter for animals. The water was very cold and the fauna poor.

The following organisms were taken from Black Beck :—

Plecoptera : *Leuctra hippopus*, adults ; *Nemura variegata*, very abundant higher up. Trichoptera : *Plectrocnemia conspersa*, larva. Neuroptera : *Sialis* sp., larva. Diptera : *Pedicia rivosa*, larva. Coleoptera : *Agabus bipustulatus*, adult.

From Grain Beck :—Plecoptera : *Perlodes mortoni* ; *Capnia nigra*, adults and nymphs ; *Amphinemura cinerea* ; *Protonemura meyeri*, adults. Trichoptera : *Plectrocnemia conspersa*, larva ; *Stenophylax rotundipennis*, larva.

From Baysdale Beck, immediately below Baysdale Abbey :—Plecoptera : *Amphinemura cinerea*, nymphs ; *Protonemura meyeri*, nymphs ; *Capnia nigra*, nymphs. Ephemeroptera : *Siphlurus lacustris*, nymphs. Trichoptera : *Rhyacophila dorsalis*, larva ; *Stenophylax stellatus*, larva ; *S. rotundipennis*, larva. Diptera : *Tipula* sp., larva ; *Dicranota* sp., larva. Oligochæta : one undetermined.

Bilsdale Beck :—The following lists indicate the considerable increase in species about the region where the stream commences to wind, thus giving rise to a variety of habitats suiting organisms which burrow, and which require less violent conditions.

	Near Chop Gate.	Junction with Raisdale Beck.	1 mile below 'Sun Inn.'
Ephemeroptera—			
Baetis binculatus	×	×	×
Rhitrogena semicolorata	—	—	×
Ecdyurus venosus	—	—	×
Ephemera danica	—	—	×
Plecoptera—			
Perla cephalotes	—	—	—
Perlodes mortoni	—	—	×
Chloroperla grammatica	×	×	×
Amphinemura cinerea	×	—	—
Protonemura meyeri	—	×	×
Nemura sp.	×	—	—
Capnia nigra	—	×	—
Leuctra hippopus	×	—	×
Isopteryx tripunctata	—	×	—
Trichoptera—			
Rhyacophila dorsalis	×	×	—
Stenophylax stellatus	×	×	—
S. infumatus	—	—	×
Hydropsyche angustipennis	—	—	×
Lasiocephala basalis	—	—	×
Gœra pilosa	×	—	—
Diptera—			
Simulium latipes	—	—	×
Atherix sp.	—	—	×
Coleoptera—			
Limnius sp.	—	×	—
Latelmis sp.	—	—	×
Crustacea—			
Gammarus pulex	×	—	—

The River Leven and its tributary, which flows through Carlton, show a decided increase in species as the course widens and deepens, thus offering an increasing variety of conditions. There is a striking difference between the fauna of the tributaries of Baysdale Beck and of that of the Leven. The following lists show the change in fauna of the Leven and its tributary.

	Stream at Carlton.	Stream at Main Road.	R. Leven at Hutton Rudby	R. Leven at Crathorne.
EPHEMEROPTERA—				
Baetis rhodani	—	—	—	×
B. binoculatus	very common	very common	—	×
Rhitrogena semicolorata	—	—	×	×
Ecdyurus venosus	—	×	—	×
Ephemera danica	—	—	—	×
PLECOPTERA—				
Perlodes mortoni	—	—	—	×
Chloroperla grammatica	—	—	×	×
Leuctra sp.	×	×	—	×
Nemura sp.	×	—	—	—
TRICHOPTERA—				
Rhyacophila dorsalis	×	—	×	×
Agapetus fuscipes	—	—	×	×
Stenophylax stellatus	—	—	×	×
Halesus digitatus	—	×	—	—
Hydropsyche angustipennis	—	—	×	×
Polycentropus flavomaculatus	—	—	×	×
DIPTERA—				
Simulium ornatum	very common	×	few	few
Limnobius sp.	—	×	—	—
Orthocladius sp.	—	—	—	×
Orthocladiariæ spp.	very few	×	very common	very common
COLEOPTERA—				
Helmis sp.	—	—	×	×
Limnius sp.	—	—	—	×
CRUSTACEA—				
Gammarus pulex	×	×	×	—
MOLLUSCA—				
Ancylus fluviatilis	—	—	×	×
OLIGOCHÆTA undet.	—	×	—	×

FUNGI (F. A. Mason) :—Vegetation was not sufficiently far advanced to expect many species of parasitic leaf fungi, but Mr. J. M. Brown, in his search for galls, quickly collected *Synchytrium mercurialis*, the two common Uredines on the Celandine, and *Puccinia violæ* ; *P. tumida* on *Conopodium*, and *Phragmidium fragariastri* on *Potentilla*, both having a distorting effect upon the plants, were also collected.

A number of species on conifers and in coniferous plantations were listed or brought for further examination, among which are the following:

Lophodermium pinastri (Schrad.) Chev. On spruce and pine needles.
Cenangium abietis (Pers.) Rehm. On spruce cones.
Phoma strobiligena Desm. On pine cones.
Tricoscypha calycina. On larch twigs.
Dasyscypha virginea. On larch cones.
Mollisia fallax. On larch cones.
M. melaleuca. On fallen wood.

Our guide (Mr. Postgate) was successful in finding one of the rarer stipitate polypores, *Polyporous fuscidulus* (Schrad.) Fr., on a wet, half-buried branch, and Mr. Greevz Fysher turned up by the stream, a long decorticated branch studded with numerous specimens of *Xylaria corniformis* Fr.

The rabbit-gnawed trees in Park Wood, discussed by Dr. Pearsall, had practically all fallen a further prey to fungi. *Polyporus adustus* appears to have been the first species to obtain entrance as a wound parasite, and this was followed by *Ustulina vulgaris* Tul., which produces a charred appearance in the wood attacked. Associated with these two primary fungi were *Ceratostomella pilifera* (Fr.) Sacc., and various fungi imperfecti belonging to the Dematiaceæ. In the Park were also found *Armillaria mellea, Fomes ferruginosus, Irpex obliquus* and *Coniophora puteana.*

Other species collected were :—*Lycoperdon pyriforme, Exidia glandulosa, Dacryomyces deliquescens, Xylaria hypoxylon, Leptosphæria acuta, Hyaloscypha hyalina, Mollisia cinerea, Stegia ilicis, Rhytisma acerinum, Trichoderma lignorum, Botrytis cinerea* var. *sclerotiophila.* Only two species of the Mycetozoa were noted, viz., *Trichia Botrytis* and *T. varia.* Later additions to this list were made by Miss M. Hewlett, who collected *Auricularia auricula-judœ* and *Isaria farinosa.*

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Boring at Grimston, E. Yorks.—Lady Waechter de Grimston informs me that a boring she has recently had put down at Grimston Garth, in Holderness, reached 180 feet in boulder clay, and was then abandoned, no water being forthcoming.—T. Sheppard.

Grey Squirrel at Baildon.—The local newspapers of May 30th described a ' Fight with a Polecat.' They stated how the animal had been seen leaving a hen-cote on the allotment of the Baildon Sailors' and Soldiers' Association, near to the hut of the Baildon Golf Club, and had been despatched by a dog. So far so good, but they began describing its length, etc., and stated, ' The animal was in good fur, brown on the back and *black* underneath ' ; also, ' it had been noticed that the birds found dead were left bloodless.' Through the good service of Mr. C. P. Gledhill the animal was brought to my office, and proved to be a fine well-grown male specimen of the North American Grey Squirrel, with a shining *white* underneath. I sent the animal to the Cartwright Hall Museum, but as it had been somewhat mangled by the dog, it was not set up, but is being preserved in spirits as a local specimen. The Grey Squirrel is a very rare vagrant in this neighbourhood.—H. B. Booth, Ben Rhydding.

YORKSHIRE VERTEBRATE ZOOLOGY.

E. WILFRED TAYLOR.

A MEETING of the Vertebrate Section of the Yorkshire Naturalists' Union was held at Leeds on Saturday, Feb. 18th, Mr. E. W. Wade presiding. The sectional meeting was preceeded by a meeting of the Yorkshire Wild Birds and Eggs Protection Acts Committee.

THE ELUSIVE SALMON.

A paper entitled 'The Elusive Salmon' was read by Mr. C. F. Procter, in which he first dealt with the growth and development of the Salmon from the hatching of the ova in the gravel 'redds,' through the parr and smolt stages, to the first migration to the sea. The period spent in the sea may vary from one to four years, and little is known of the movements during this period. Eventually the Salmon return to the river in which they originated, even making for the same tributary, in order to reproduce their species.

Many of the habits of the Salmon are well known through the fortunate fact that each scale is stamped with the life history of the fish. The art of scale reading has been highly developed by recent workers.

The lecturer regarded the Salmon family as one of recent origin. The various members of this family seem somewhat unstable and able to respond quickly and radically to changes of condition and environment.

The lecturer stated that 70 per cent. of European Salmon were taken from the rivers and estuaries of Great Britain, and he was confident that very beneficial results would follow the purification of our rivers, many of which had been important Salmon rivers before they were ruined by industrial pollution.

Attention was called to the clearly marked runs of early, late, large and small Salmon, which characterised different rivers, and to the fact that these runs represented different races of Salmon which transmitted the same characteristics to their offspring. The heavy mortality among spawning Salmon was also referred to, and the fact that the great proportion spawn only once.

A peculiarity of the species lies in the very marked periods of growth and retrogression. Salmon fry feed ravenously in the rivers, and the smolts continue to do so in the sea—at any rate through the summer months—but on returning to fresh water they make little or no attempt to feed, and exist on their stores of fat. When a fish enters the river very early—say in February—and spawns in the November following, more than a year may elapse during which no food is taken. The growth of the fish and of its scales are modified by the feeding habits, and the periods of rich feeding in the sea and abstention in the rivers are clearly marked on the scales.

EARLY ORNITHOLOGY.

A paper was next given by Mr. E. W. Wade entitled 'Ancient and Modern Ornithology,' in which the lecturer stated that in these days, when every movement or action of a bird is described and recorded as hard dry facts, and when everything must be explained, it is something of a relief to turn to the earlier writers who, at any rate, regarded a bird as something more than a mere machine, and allowed it some reasoned intelligence.

Thus the Phœnix was believed to be master of its own fate, and deliberately to destroy itself in order that youth might be restored by the springing forth of another Phœnix with youthful powers renewed for a further century.

For 2000 years Aristotle was the first authority on matters of science ;

born 384 B.C., he studied under Plato, and was later tutor to Alexander the Great, when no doubt he profited by the great natural history resources of the Macedonian kingdom.

Aristotle was a keen observer and philosopher, but it was impossible for him to verify all his facts ; his writings became the recognised authority until the time of Linnæus.

The following extracts give some idea of the beliefs and mistakes of this early period.

'If it thunders while a hen bird is sitting the eggs go addled.'

'The Hoopoe is the only bird that builds no nest whatever.'

'The Swallow is the only carnivorous bird that builds its nest twice in a year.'

'By the way, after drinking wine, the Parrot becomes more saucy than ever.'

'In some cases birds may be said to come from the ends of the earth, as in the case of the Cranes, for these birds migrate from the Steppes of Scythia to the marshlands where the Nile has its source ; from one end of the world to the other. The story told about the stone is not true—to wit—that the bird carries in its inside a stone by way of ballast.'

'Swallows have often been found in holes quite denuded of feathers.'

'They say no one has ever seen the young of the Cuckoo—the bird lays eggs, but does not build a nest. It lays by preference in the nest of the Ring Dove, after first devouring the eggs. It lays only one egg, and does not hatch it itself, but the mother bird, in whose nest it has deposited it, hatches and rears it. The truth is, this bird is pre-eminent in the way of cowardice. It allows itself to be pecked by little birds and flies away from their attacks.'

'The Sea Eagle is very keen sighted. It tries to make its young stare at the sun, beats the one that refuses to do so, and twists him back in the sun's direction. If one of them gets watery eyes in the process it kills him and rears the other.'

'For as the Owl is dim sighted by day, the Crow at mid-day preys on the Owl's eggs, and the Owl at night upon the Crows, each having the whip hand of the other, turn and turn about.'

'Dolphins ascend rapidly in order to breathe, and in the effort they spring right over a ship's mast if one is in the vicinity.

OTHER RECORDS.

Mr. Booth referred to the 'Eagle' reported in the newspapers as frequenting Crake Moor, and described his visit to the vicinity. It was probable that the bird was really a Rough-legged Buzzard. The press report was very inaccurate, and the bird had attacked neither dogs nor sheep.

Mr. Booth reported that he had done his best to persuade Dr. Hogarth to submit his reported British Wild Cat to the authorities at the South Kensington Natural History Museum. Dr. Hogarth declined to submit his specimen to the risks of transit ; he said, however, that when he next went up to London he would take it to the museum himself. In the meanwhile it seems best to allow this record to stand in abeyance, as Mr. Booth, who has seen the specimen, does not think that Mr. Robinson's record will be confirmed.

YORKSHIRE MAMMALS.

At the evening meeting Mr. Riley Fortune gave an illustrated lecture on 'Yorkshire Mammals,' and stated that there were at present forty-one species of wild animals living in the county, excluding the Whales. These are divided among six orders as follows : Chiroptera, nine species ; Insectivora, five ; Carnivora, nine ; Cetacea, two ; Ungulata, three ; Rodentia, thirteen species.

Of the twelve known species of British bats, nine are found in

Yorkshire. Of these the Long-eared Noctule and Pipistrelle are common ; the Barbastelle has only recently been added to the Yorkshire list. Leister's Bat is rare. Natterer's, Daubenton's, and the Lesser Horseshoe are sparingly distributed, while the Whiskered Bat is not uncommon.

Of the five species of Insectivora, the Hedgehog and Mole are the best known, while the three species of Shrew are not much in evidence, although well distributed.

One of the most interesting of the Carnivora is the Wild Cat, which probably lingered in the county up to the middle of the last century ; in some cases entries in the parish register record the sums paid for the destruction of 'Wylde Cattes.'

The Fox no doubt owes his present status in the County entirely to hunting, and would otherwise almost certainly have become extinct.

The Badger has continued to hold its own, partly because of its nocturnal habits, but chiefly because it does not do sufficient harm to earn any very determined hostility.

The Otter is a member of the Weasel family, and is still plentifully distributed in the county. Owing to its quiet and noctural habits its presence is frequently unsuspected, as when a pair bred for several years within the walls of the City of York.

The Pine and Beech Martens are probably not different species, and both have been regarded as extinct in this county ; however, individuals continue to turn up from time to time in widely different parts of the county, and a few may survive as residents.

The Stoat is still plentiful in spite of the activities of the gamekeeper, and partially white examples are frequently obtained in winter, though pure white skins are rare. White examples of the Weasel are also reported from time to time, but refer always to albinos.

The Polecat is now regarded as extinct in the county ; it is a very blood-thirsty creature, and has been known to kill sixteen turkeys in one night.

The Common and Grey Seal are found around the Yorkshire coasts, where they are persecuted by the fishermen, who have greatly reduced their numbers.

The Ungulates are represented by three species of Deer. The largest is the Red Deer, and several very ancient herds exist in the county—herds of Fallow Deer are even more numerous. Roe Deer were plentiful in the forests of Pickering in the time of Edward III., and are peculiar as a species, inasmuch as both sexes carry antlers. In recent times two herds of wild White Cattle have existed in the county.

Both the Red and Grey Squirrel are found in the county, the former in rapidly decreasing numbers.

Of the Rodents, the Dormouse and Harvest Mouse occur sparingly, while the House Mouse, Long-tailed Field Mouse and Brown Rat are everywhere. The Black or Old English Rat is chiefly confined to the seaports, and the Water Vole, Field Vole and Bank Vole are all well distributed.

The Common Hare keeps its numbers up in spite of continual persecution, and the Scottish or Mountain Hare was introduced into Yorkshire in 1867 and 1880. The descendants of the latter importation have increased, and are now common over a wide area of the Yorkshire-Derbyshire border.

The Rabbit was last dealt with, and concluded a most interesting lecture illustrated by what must be one of the finest and most complete sets of lantern slides of British mammals in existence.

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R. S. Bagnall and J. W. H. Harrison write on 'The British Species of the Chalcidid Genus Harmolita (Hymenoptera) as indicated by their Galls,' in *The Entomologist's Record* for May.

YORKSHIRE BRYOLOGISTS AT HOLME MOSS.

F. E. MILSOM.

Continuing their investigations of the Southern Pennines, a party of bryologists met on March 24th for a visit to the upper part of Raikes Dyke, on Holme Moss. A successful day resulted, with good weather and satisfactory gatherings. Among the mosses, the most gratifying was *Tetraplodon mnioides*, on a sheep skeleton. This had been found on Holme Moss some years previously, in a doubtful position near the boundary between V.C.'s 57 and 63, and its confirmation in Yorkshire was desired, as it is new to V.C. 63.

Among the hepatics, *Aplozia sphærocarpa* was interesting, the only previous record for the vice-county being Hebden Bridge. It occurred in fair quantity on the higher ground near the top of the hill.

The following list includes the more interesting species found :—

Mosses.

Oligotrichum hercynicum.
Polytrichum aloides.
Fissidens adiantoides.
Rhacomitrium aciculare.
Tetraplodon mnioides.
Webera proligera.
Pterigophyllum lucens.
Brachythecium plumosum.
Hyocomium flagellare.
Hypnum ochraceum.

Sphagna.

S. plumulosum.
S. squarrosum.
S. recurvum.
S. rufescens.

Hepatics.

Aneura multifida.
Aplozia crenulata var. *gracillima.*
A. sphærocarpa.
Lepidozia reptans var. *tenera.*

Lichens.—Mr. W. E. L. Wattam writes :—The old walls of sandstone alongside the road to the village of Holme, with their humus pockets, yielded *Parmelia physodes* Ach., *P. saxatilis* Ach., *Candelariella vitellina* Mull-Arg., *Lecanora muralis* Schaer., *Cladonia pyxidata* Hoffm., *C. fimbriata* Fr., *C. gracilis* Willd. On old palings occurred *Lecanora varia* Ach., and a heavily lime-capped wall was well patched with *Lecanora galactina* Ach.

Ellentree Valley, Holme, has not much choice of habitat for lichen growth. The lower portion is rough, swampy pasture with *Eriophorum vaginatum*, Nardus and Juncus as dominant plants. About half way are a few trees of Mountain Ash and Birch, and here the rock escarpment becomes more pronounced and steep, and the vegetation is decidedly of a drier type, Deschampsia, Bilberry and Empetrum predominating, and thus a thin layer of peat is formed. Sandstone blocks and boulders next strew the valley, until the summit at Carr Naze is reached, with its capping of millstone grit. The species found were *Parmelia physodes* Ach. at base of Birch boles, *P. saxatilis* Ach., *Candelariella vitellina* Mull-Arg., *Lecanora muralis* Schaer, *L. galactina* Ach., *L. conizæa* Nyl. on Birch boles, *L. polytropa* Schaer, *Bæomyces rufus* D.C., very fine on sandstone blocks, with a little of its variety *subsquamulosa* Nyl., on pockets of sandy debris in the niches of boulders, *Cladonia pyxidata* Hoffm., *C. fimbriata* Fr., and its var. *simplex wainio*, *C. gracilis* Willd., *C. digitata* Hoffm., *C. coccifera* Willd., and its f. *phyllocoma*, *C. flœrkeana* Fr., *Lecidia contigua* Fr., in several varieties ; *L. sanguinaria* Ach. (sterile), *L. lithophila* Ach., and *L. granulosa* Schaer, on peaty soil amongst Empetrum.

YORKSHIRE HEMIPTERA IN 1927.

JAMES M. BROWN, B.Sc., F.L.S., F.E.S.

THE character of the season 1927 was not such that any great advance in our knowledge of the distribution of the Hemiptera in Yorkshire was probable, yet we can record several interesting captures of insects either new to the county or rarely met with. Four species and one variety of Heteroptera, and one species of Homoptera, are noted below as additions to our list. Of these, three of the Heteroptera are given in Butler's ' Biology of the British Hemiptera-Heteroptera,' as Yorkshire insects, but as no localities are noted in that work, we have no details regarding them, but probably one of them refers to Dr. Fordham's 1912 record, noted below.

Hemiptera were taken on most of the Yorkshire Naturalists' Union excursions during the year, and reference may be made to the published reports for details.

I am again indebted to the following members of the Committee for notes or specimens : Messrs. W. J. Fordham (F) W. D. Hincks (H), and M. L. Thompson (T). Uninitialled records are my own.

† New to the County. * New to the Vice-County.

HETEROPTERA.

Acanthosoma hæmorrhoidale L. Nether Edge, Sheffield (see *The Naturalist*, 1927, p. 336). This seems to be a very occasional visitor to Yorkshire, where it reaches its most northerly limit in England. It is doubtful if it breeds with us.

Elasmucha grisea L. Buttercrambe Woods, (T.).

Myrmus miriformis Fall. Allerthorpe, 9/23 (F.).

†*Cymus claviculus* Fall. Allerthorpe (H.). This again is a southern species, rarely met with north of Norfolk.

Ischnorhynchus ericæ Horv. (*geminatus* Fieb.). Plentiful under heath and heather, Allerthorpe (H.). 61*.

Stygnocoris fuligineus Geoff. Barnby Moor (F.). Allerthorpe.

Drymus sylvaticus F. Blackmoor (H.).

Scolopostethus thomsoni Reut. Buttercrambe Woods (H.).

S. decoratus Hhm. Allerthorpe (H. and F.).

Piesma maculata Lap. (*capitata* Wolff.). Blackhills (Leeds) (H.).

Tingis (*Monanthia*) *cardui* L. Buttercrambe Woods (H.). 62*.

T. ampliata H.S. Allerthorpe (H.).

Ploiariola vagabunda L. Ryecroft Glen (near Sheffield). 63*. This species commonly shelters in ivy and in yew.

†*Triphleps minuta* L. Under elm bark, Breighton (E. Yorks.), 12/12 (F.).

Microphysa elegantula Baer. In the crevices in oak bark, Millhouses, near Sheffield. 63*. The only earlier county record is from Mulgrave Woods.

†*Phytocoris populi* L. var. *distinctus* D. and S. A very dark variety, found resting on tree trunks. Ecclesall Woods (Sheffield).

P. ulmi L. Allerthorpe (F.).

Adelphocoris (*Calocoris*) *lineolatus* Goeze. Eston-in-Cleveland (T.).

Calocoris roseomaculatus De G. Taken again at Allerthorpe (F.).

C. ochromelas Gmel. Buttercrambe Woods (H.). Immature specimens only were obtained.

Stenotus binotatus F. Allerthorpe (F.). This species does not seem to be at all common in the county ; it should occur in general sweepings.

Lygus lucorum Mey. Filey (F.).

L. pratensis L. Allerthorpe (F.).

L. rubricatus Fall. Plentiful on firs, Wyming Brook, near Sheffield. 63*.

L. pastinacæ Fall. On nettles, Craythorne (Cleveland) (F.).

†*Deræocoris* (*Capsus*) *ruber* L. Buttercrambe Woods (H.) (see *The Naturalist*, 1927, p. 243). This has not been recorded previously north of Notts.

Miris dolobratus L. Allerthorpe (F.).

M. ferrugatus Fall. Sedbergh.

Bryocoris pteridis Fall. Sedbergh.

Cyllocoris flavonotatus Boh. Allerthorpe (H.).

Orthotylus marginalis Reut. Sedbergh. 65*.

O. virescens D. and S. (*chloropterus* Kb.). Sleights (T.).

†*Heterocordylus genistæ* Scop. On *Genista tinctoria*, Ingleton. This species probably occurs in other localities where its food plant grows.

H. tibialis Hhn. A much commoner species occurring on Broom, taken again at Allerthorpe (H.).

Phylus coryli var. *avellanæ* Mey. Sedbergh.

Psallus betuleti Fall. Allerthorpe (H.).

P. variabilis Fall. Buttercrambe Woods (H).

Atractotomus magnicornis Fall. On firs, Ingleton. 64*.

Plagiognathus chrysanthemi Wolff. Forge Valley (F.).

Asciodema obsoletum Fieb. Common on gorse, Sleights (T.). Sedbergh.

Gerris najas DeG. Hebden Brook (E. Percival) (*The Naturalist*, 1927, p. 242).

G. costæ H. S. Greatham (T.).

G. odontogaster Zett. Birdwell.

Microvelia pygmæa Duf. Greatham (T.), 62*. Askham Bogs, 64*. This minute species is plentiful among *Lemna*, and is probably often overlooked.

Acanthia (*Salda*) *saltatoria* L. Glaisdale (T.). Birdwell.

A. c-album Fieb. Grassington.

Chartoscirta (*Salda*) *cincta* H. S. Greatham (T.).

Arctocorisa (*Corixa*) *hieroglyphica* Duf. Grassington, 64*.

Callicorixa præusta Fieb. Whernside, 5/21 (F.), 64*. Allerthorpe, 3/21 (F.), 61*.

HOMOPTERA.

Philænus campestris Fall. Stanhope (T.).

P. lineatus L. Baldersdale (T.).

Ulopa reticulata Fab. Allerthorpe (H.). A small species, plentiful under heather.

Macropsis impura Boh. Occurs on *Salix repens*, Allerthorpe, 6/21 (F.). Sedbergh. 65*.

M. rubi Boh. On brambles, Ecclesall Woods.

†*Idiocerus elegans* Flor. On sallow, Sedbergh.

I. confusus Flor. Wyming Brook (near Sheffield).

I. albicans Kbm. Wyming Brook.

Acocephalus bifasciatus L. Baysdale-in-Cleveland (T.).

A. albifrons L. Middlesborough (T.).

Deltocephalus ocellaris Fall. Birdwell.

D. distinguendus Flor. Filey (F.).

Thamnotettix prasinus Fall. Birdwell.

Athysanus sordidus Zett. Allerthorpe (F.).

A. lineolatus Br. Filey (F.).
A. absoletus Kbm. Falcon Inn (Scarborough) (F.).
Cicadula 6-notata Fall. Farnley (Leeds) (F.).
Chlorita flavescens Fab. Millhouses (Sheffield).
Eupteryx stachydearum Hdy. Birdwell.
Typhlocyba 6-punctata Fall. Ecclesall (Sheffield).
T. ulmi L. Bubwith (F.).
Zygina alneti Dahl. Sedbergh. 65*.
Cixius cunicularius L. Ingleton.
C. nervosus L. Sedbergh.
C. brachycranus Scott. Filey (F.).
Delphax difficilis Edw. Kildale (T.). Birdwell.
Dicranotropis hamata Boh. Crathorne (F.).
Aphalara nebulosa Zett. Buttercrambe Woods (H.). Birdwell. Plentiful on *Epilobium angustifolium*.
Psylla buxi L. Plentiful on box, Ingleton. 64*.
P. nigrita Zett. On firs, Buttercrambe Woods (H.). Witton Fell.
P. fosteri Flor. Buttercrambe Woods (H.).

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DARLINGTON FIELD CLUB.

At the annual meeting of the Darlington and Teesdale Naturalists' Field Club, Mr. G. L. Drury was elected President in succession to Mr. J. Bowker. Other officials were reappointed as follows :—Hon. Treasurer, Mr. R. H. Sargent ; Hon. Secretary, Mr. J. E. Nowers ; Librarian, Mr. H. D. Pritchett ; and Hon. Excursion Secretary, Mr. G. H. Nichols.

In his annual report Mr. Nowers gave a resume of the activities of the various sections, and pointed out that in most cases good work had been carried out. He reported that 26 new members had been enrolled during the year, including eight juniors, the total membership being 188. There had been an average attendance of 40, as compared with 37 last year.

Mr. C. P. Nicholson, organiser of the footpaths section, reported that the club had carefully kept open the footpath between Croft and Barton. Two bridges in the Harrowgate Hill district, which had disappeared, had been replaced by the Rural Council.

Mr. G. L. Drury stated that an unusual feature of bird life during the year had been the apparent indifference of the birds to the inclement weather. In spite of the severe frosts at the time, nearly all the spring migrants arrived within 48 hours of their usual time. Early in the season a chough was seen a short distance up the Tees. This was remarkable, as the chough was an exceedingly rare bird, and its only haunts were the west coast of Ireland and the cliffs of Wales. Mr. Drury suggested the possibility of the bird having escaped from captivity.

FIELD NOTES.

Platyarthrus hoffmannseggii Brandt near Sheffield.—In his account of ' The Guests of Yorkshire Ants ' (*The Naturalist*, 1915, p. 388), Mr. Stainforth gives the known distribution of this woodlouse in the county, and his map shows no records for V.C. 63 or 65. I am now able to extend its known range into S.W. Yorks., having taken it recently in the nests of *Donisthorpea flava* at Kiveton Park, near Sheffield. This, I believe, is the first time it has been noticed in V.C. 63.—James M. Brown, Sheffield.

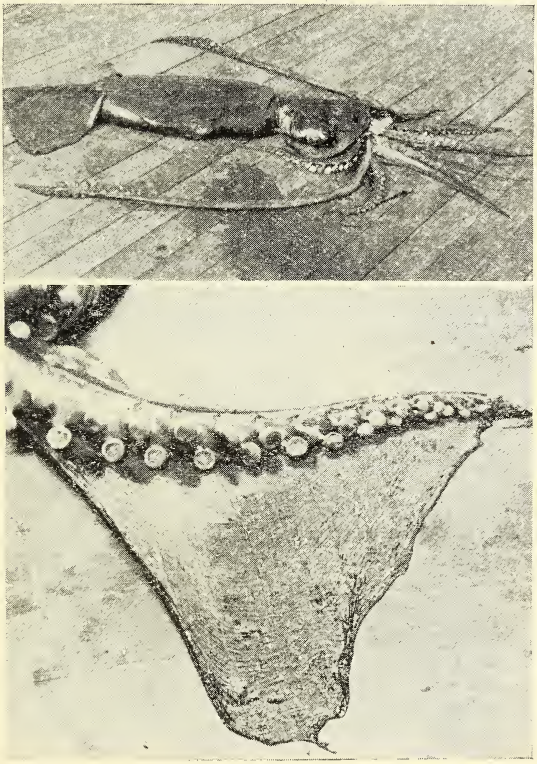
Sepia officinalis L.—In *The Naturalist*, April, 1928, p. 115, Mr. J. A. Stevenson states that in December (1927) several *Sepia* shells were found on the shore at Scarborough, and that it was a long time since perfect specimens has been seen there. We have other recent records of the abundant occurrence of *Sepia* shells. R. Spärck (*Vidensk. Meddelelser fra Dansk naturhistorisk Foren.* i Köbenhavn, 76, 1923, p. 141-145) states that the Zoological Museum in Copenhagen, in the spring 1923, received inquiries from several people on the Faroe Islands regarding some ' peculiar shells there in considerable number began to drive on the shore at different places,' and he found them to belong to *Sepia*, according to the same writer, the *Fishing News* for May 12th, 1923, records that many shells and several living Cuttlefish was driven on the shore of Northern Scotland in the spring of 1923. Also from Norway we find records from the same period. O. Nordgaard (*Det Kongelige Norske Vidensk. Selsk. Forhandl.*, I, 17, 1928, p. 50-51) says, that in the beginning of July, 1923, he received several shells of *Sepia* from the coast of the Trondhjem area, and that ' such shells did not commonly occur in these places, but they were known before by some of the inhabitants. From Titran it was told that such shells in previous days had been used as medicine for cows during the act of calving, and from Hasvaag in Flatanger was related that similar shells occurred thirty to forty years ago, and were used as remedies against several maladies,' and later, in the summer of 1923, several specimens was noticed from other places of Norway from 63-70° N. lat. We have several old records for numerous occurrences of *Sepia* shells from the Northern North Sea coast, etc. Posselt (*Det vidensk. Udbytte af Kanonbaaden ' Hauch's ' Togter*, 1893, p. 142) declares that *Sepia* shells are often found in hundreds, driven on the shore of western Jutland (Lovén, *Kungl. Svensk. Vetensk.—akad, Handl,*. 1845. p. 122), and that they are found commonly at the shore of Bohuslän (Sweden), and Boeck and Rasch (*De skandinav. Naturforsk. fjerde Möde i Christiania*, 1844, p. 232-233) state that *Sepia* was found at Frederiksværn and Moss (Norway), and that one year numerous living Cuttlefish were observed at Frederiksværn. According to Macgillivray ('A History of the Molluscous Animals of the County of Aberdeen,' 1843, p. 29) living Cuttle fish has not been observed; Spärck (*loc. cit.* p. 146) declares that the northern part of Scotland seems to be the northernmost localities for *Sepia* shells, and that the sudden occurrence in northern waters might be explained by considerable changes in the oceanic currents.—HANS SCHLESCH.

Andromeda polifolia Linn. near Goathland, North Yorkshire.—On the 9th June, 1924, Miss H. V. Medlicott, of Partridge Hill, Goathland, found a small, shrubby plant in flower in a boggy place on the moor near Saltersgate, which Captain Medlicott named *Andromeda polifolia*. He sent this specimen in a letter to Mr. Edgar Sykes, who was at that time the schoolmaster here. Mr. Sykes confirmed the identification. On the 16th June, 1925, I accompanied Captain Medlicott to the place where his daughter found *Andromeda*. We made a careful, but unsuccessful search. Since then several unsuccessful attempts have been made to find more. *Vaccinium oxycoccos* Linn. is plentiful in this situation. Unfortunately, Mr. Sykes, now of Scarborough, had misplaced Captain Medlicott's letter containing the original specimen. However, I urged him to try and find it, and on the 26th March, 1928, I received from Mr. Sykes Captain Medlicott's letter, which was dated 16th June, 1924. In order that there might be no doubt about the identity of this plant I sent it to Mr. W. A. Sledge, B.Sc., of Leeds, who had not the slightest hesitation in naming the specimen *Andromeda polifolia*, and he assured me he had no doubt about it. Baker, in his 'Flora of North Yorkshire,' gives two stations only for this plant: one on Strensall Common in No. 1 district, the Ouse and Foss Area; and the other in or near Balderdale in No. 9 district, the West Tees area. The station at Saltersgate is, therefore, the second record in vice-county 62. Certainly it would have been better had more specimens been found, but further search will be made.—R. J. FLINTOFF, Goathland.

Black Tern, etc., at Hornsea Mere.—A few of our members attending the Spurn excursion of the Y.N.U. spent most of Whit Tuesday at Hornsea Mere, where we encircled the lake. On our arrival we were delighted to watch a Black Tern (*Hydrochelidon nigra* L.), which shortly afterwards settled on a buoy and remained there for a considerable time. Soon afterwards we were interested in a Black-headed Gull, which was in the height of winter plumage, although it was the 29th of May! No doubt, its sexual organs were deranged. In addition to the usual birds of the Mere, I was greatly impressed by the increase of Pochards since my last visit, just two years ago, and we saw several females with ducklings. There were also more Shovellers than I have ever seen there before. We had a splendid view of one pair, and later I put up four males ; who doubtless had their mates incubating. It is usual to find a pair of non-breeding Common Sandpipers there, but this year the numbers had doubled—there were four birds present. Finally I had the pleasure of hearing the squeak and the grunt of the Water Rail. I have seen many Water Rails (mostly in winter), and have also found a nest, but have never before heard their squeak and grunt. It is described as like those of a pig, but to me it appeared to be more like that of a ' porker,' of not more than a month old. The vegetation was so dense that I could not see the bird, or birds, and I could not be certain whether one bird was making both the sounds, or whether one bird was making the squeak and the other the grunt.—H. B. BOOTH, Ben Rhydding.

Date of Arrival of Ring Ouzel.—For some years I have been trying to obtain the exact dates of the arrival of our first summer migrant, the Ring Ouzel, but was met with the difficulty that it would first be seen on the uninhabited fells and high moors visited by few people during the early days of March. All the books record that it arrives from its winter quarters in the Mediterranean on the south-west coast of England, but as it is practically always seen first in the north of England, it suggests the first migration arrives on the north-east coast of England, or if it arrives on the south-east coast it moves up north without stopping there at all, although the 1907 record alone points to the latter. The following are the dates when it was first recorded, all these being in March except when stated otherwise : 1905, Derby, 20th, Yorks., 25th ; 1906, Yorks., 21st and 25th ; 1907, Yorks., 21st ; Somerset and Essex, 23rd ; 1908, Yorks., 23rd and 24th ; 1909, Shropshire, 9th, Derby, 13th ; 1910, Chester-Derby border, 11th ; S.W. Yorks., 13th ; 1911, no record until April 4th from Norfolk ; 1912, Westmorland, 29th ; 1916, N. Donegal, N. Ireland, 17th (the most northerly record) ; 1919, N. Lancs., 29th ; 1923, Cumberland, 13th ; 1924, Cumberland, 23rd ; 1927, Mid-Lancashire, 7th, and Lancs.-Cumberland border, 12th ; 1928, Westmorland, 6th (pair and 7th (many). As I was quite sure that the bird arrived much earlier than had ever been recorded, I paid special attention to it during this spring and that of last year to find, as the dates show, that as early as March 7th the species may be well established in northern England. For the south of England the first record for instance for 1909 was April 5th, viz., from South Wales, and in 1910, March 30th saw the first one in Cornwall. For the earlier years I am indebted to the *British Ornithologists' Club's Bulletin*, and for the later ones to *The Field* and to correspondents, in addition to my own observations. That some Ring Ouzels remain in Devon and Somerset during a mild winter there is little doubt, but for them to do so in the north is most unusual, although my friend, the Rev. E. U. Savage, records one on the Westmorland fells as late as November 29th last year (1927).—H. W. Robinson, M.B.O.U., F.Z.S.S., 37 West Road, Lancaster

A large Squid (Stenoteuthis caroli) at Scarborough.—On February 1st my brother heard of a large Squid on the shore, south of Scarborough. As most large Squids are very rare, and particularly at Scarborough, he made repeated visits and, eventually, found a specimen about 3½ feet long, but very mutilated. He secured the head and tentacles, which Mr. W. J. Clarke sent to the British Museum (Natural History), who reported that the squid was *S. caroli*, and was apparently the fourth example recorded, three of which have been found on the Yorkshire Coast.—J. A. Stevenson.



Sea Gulls in Upper Wharfedale.—An unusual sight for Wharfedale has been a flock of at least 500 gulls in one of the fields adjoining Menston Asylum. The invasion was due to the asylum authorities disposing of their pigs'-swill on one of their fields (the pigs had been killed off owing to an outbreak of swine fever). The swill was first put out on the 10th February, and in two or three days' time gulls appeared, and from the 14th February to the last week in March (when the swill was last spread on the field). The field adjoins a number of high lying fields frequented by Curlews, and between Gulls, Rooks and Curlews there was an assembly of bird life probably never seen before in these parts. The Gulls were mostly Black-headed Gulls, but there were numbers of Lesser Black-backed and Herring Gulls, both mature and immature, and a few Common Gulls.—JAS. Y. GRANGER, Menston.

Trypeta artemisiæ Fabr.—During August, 1927, I received two samples of cultivated Chrysanthemum foliage from Scotland, which were badly damaged by a leaf mining maggot. The larvæ pupated, and the imagines began to emerge early in May. Specimens were submitted to Mr. C. A. Cheetham, who considers them to be *Trypeta artemisiæ* Fabr. I have seen this fly on several occasions in the East Riding of Yorkshire, and I believe it feeds upon Burdock, *Arctium majus* Bernh. I do not know if this fly has been previously recorded as feeding up in Chrysanthemums. I have not seen it doing so before.—G. C. JOHNSON, Lewes, Sussex.

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THE ARMS OF HULL.

The Duke sat down to dine,
  A menu card had he,
Adorning which in anadine,
  Three crowns the Duke did see.

'What mean these signs ?' he queried,
  But none their meaning knew ;
He asked of T. R. Ferens,
  And the Mayor, and Bishop, too.

Can no one help His Highness ?
  Can none the answer say ?
How is it three crowns represent
  The Arms of Hull to-day ?*

All eyes then turned to Sheppard.
  He ought to know—he *must* !
They seek in vain an answer ; and
  He's humbled to the dust !

Oh, Tom ! at such a moment,
  Why did you fail us so ?
The Duke had asked the *one* thing
  That Sheppard did not know !

C. M.

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* The Duke should have given 2/6 for 'The Correct Arms of Hull,' by T. Sheppard, Ed.

CORRESPONDENCE.

RIVER POLLUTION.

Referring to the criticisms in your October, 1927, issue by Mr. Haigh Johnson, the method of surveying rivers adopted by Dr. Jee is that designed by the Scientific Advisory Committee of the Ministry of Agriculture and Fisheries, and has the support of the Government Chemist and of the Rivers' Board, to which Mr. Johnson is attached.

The Standing Committee has so far considered over 200 such reports since its formation in December, 1921, and has found the results of surveys thus made of great practical value in its campaign to get clean rivers. The particular report on the River Wharfe under criticism has been of great service to the Yorkshire Fishery Board, on whose behalf the survey was undertaken.

Quite apart from the scientific disagreement which underlies the criticism, I fail to see what method of surveying is recommended by Mr. Johnson, and until he publishes his methods of surveying and the results obtained therefrom, his criticisms must be regarded as those of a person who has failed in the course of fifteen months to identify the danger spots on the River Wharfe on which Dr. Jee was able to express a reliable opinion in the course of a couple of days.

It may be added that it is no part of the scheme of the Standing Committee to study river pollution merely as a pastime, but rather to identify the sources of pollution with the least possible delay, and then press for remedial measures, to which end the surveys carried out by Dr. Jee serve the purpose of the Committee—admirably.—J. H. R. Bazley.

Mr. Bazley is misinformed when he suggests that the West Riding Rivers Board ever adopted any methods of the Scientific Advisory Committee or that the Government Chemist is regarded as an authority on these problems. The great pity is that the Standing Committee has been allowed to publish so many similar reports hitherto unchallenged.

The West Riding Rivers Board has always had its own methods of analysis ; the methods used in the periodical examination of the rivers have invariably included a full range of recognised chemical and bacteriological laboratory tests.

It is certainly somewhat incongruous to suggest that the single field-test which Dr. Jee applied in his River Wharfe investigations could furnish results in any sense comparable with those obtained from the exhaustive methods of the West Riding Rivers Board. The single-test might certainly be used as a preliminary or adjunct to the usual analytical determinations, but to supplant these entirely by this test is most unwarrantable, and is only equalled by the official effrontery which could offer such a criticism on such unsatisfactory evidence.

The "danger spots" on the River Wharfe, are well-known to the Board's Inspectors and it is noteworthy that Dr. Jee's investigations failed to locate one of the worst pollutions of this River !

I trust that Mr. Bazley now realises that the time devoted to the recent examination of this river by the local River Investigation Committee is an indication of the interest taken by naturalists and others in the purity of our streams, and further, that this considerable expenditure of time and effort was occasioned by a local application of the unreliable test, designed, presumably, by the Scientific Advisory Committee ; in which case Dr. Jee might be regarded as somewhat of a victim of circumstances.

In conclusion, I hope that Mr. Bazley recognises that these official committees are really of little or no use ; they are in fact derelict, and as such a real danger to all progress. Their action as in this instance often causes much unnecessary trouble and expense to the detriment of all concerned. Perhaps, when the Ministry of Agriculture and Fisheries is scientifically equipped to supplement these field-tests by serious laboratory work ; the efforts of others will be appreciated.

I do not agree that it is incumbent upon me to produce any evidence of new and original methods of analysis. The mere fact that local officials adopted the usually recognised analytical procedure, which was entirely discarded by the official investigator, should, I think, suffice. Lest, however, my intention be mistaken, I would refer Mr. Bazley to a paper entitled ' A critical review of the Methods of Analysing Waters, Sewages and Effluents, with suggestions for their improvement,' which the present writer delivered before the Society of Public Analysts in November, 1926, which was printed in *The Analyst* of March, 1927. This paper further demonstrates the evil effects of present official methods on scientific development, and also, on the other hand, that Yorkshire officials occupy a prominent position in matters of efficiency and progress. —J. W. HAIGH JOHNSON.

——: o :——

It was recently reported in the press that the Duke of York, during a luncheon at Hull, had enquired the meaning of the City Arms, which none had been able to answer.

From the Annual Report of the Dorman Memorial Museum, recently issued, we learn that during the year over 500 letters and other communications have been written.

The Shaw Collection of one hundred and seventy-two cases of stuffed birds, mainly British, is one of the numerous additions to the Halifax Museums, recorded in their second annual report.

As an indication of the interest taken nowadays in scientific books, the library formed by the late J. W. Carter, of Bradford, we hear, was recently offered for sale on a stall in the market at Dewsbury. The vendor shouted, ' Pick where you like—threepence each, any of 'em.'

The Sixth Annual Report of the Russell-Cotes Art Gallery and Museum, Bournemouth, shows that its income from the sale of catalogues, postcards, etc., during the year amounted to £442, as against £441 last year.

At a recent meeting of the Geological Society of London, Dr. G. H. Mitchell read a paper on ' The Succession and Structure of the Borrowdale Volcanic Series in Troutbeck, Kentmere, and the Western Part of Long Sleddale (Westmorland).'

The Royal Society for the Protection of Birds is making an appeal for funds for the purchase of a portrait of the late W. H. Hudson. This has been painted by Mr. Frank Brooks, of Lyndhurst, and it is suggested it should be hung in the Society's rooms.

From the Imperial Fisheries Institute of Japan we have received No. 4 of Volume XXIII. of its Journal, which is printed in English, and contains a valuable series of essays, among which are ' Studies on Fish-disease,' by Yoshiichi Matsui and Asao Kumada ; and ' Chemical Studies on the Silkworm-pupa as Fish-food,' by Oshima-Shinobu.

Bulletins Nos. 15 and 16 of the Bureau of Bio-Technology contain a particularly varied and valuable series of monographs, many being illustrated. Among them are ' An old Recipe for Sweetening Casks ' ; ' An Unusual Growth-form of *Monilia candida* ' ; ' The Giant Wood-wasp in a Fermenting Vessel,' and others. Mr. F. A. Mason seems largely responsible for the publication.

Mr. H. W. Dickinson describes The New Buildings of the Science Museum in *The Museums' Journal* for May ; and the Editor grumbles because his colleagues do not assist him in the way they should, his note concluding with :—

' Ignore all selfish ends and interests of thine own—
He lives for little good who lives for self alone.'

REVIEWS AND BOOK NOTICES.

Wild Creatures of Garden and Hedgerow, by **Frances Pitt.** London : Constable & Co., x.+285 pp., 7/6 net. The first edition of this interesting volume was reviewed in *The Naturalist* for October, 1920. As we then expected, the demand has been such that a new edition has been called for, and it has been possible to sell this at the reduced price of 7/6.

A Country Calendar, by **Tickner Edwardes.** London : John Lane, The Bodley Head, 300 pp., 7/6 net. Mr. Tickner Edwardes has long been known as a versatile writer on various natural history topics, and in the present case he has a dozen good essays, each containing a month's observations on various aspects to wild life. In this way he covers the year from January to December.

Feathered Friends of Field and Forest, by **Eleanor E. Helme.** London : The Religious Tract Society, 112 pp., 7/6 net. Printed in large type, and with beautiful coloured illustrations, mounted on stiff tinted papers, by Barbara Briggs, aided by occasional sketches in the text, the author has produced this fine volume. The species dealt with are Goldfinch, Jackdaw, Magpie, Jay, House Martin, Wren, Lapwing, Barn Owl, Kestrel, Swift, Skylark, Green Woodpecker, Cuckoo, Greenfinch, Rook, and Fieldfare and the descriptions have been carefully written for the benefit of young readers.

British Mosquitoes and how to Exterminate Them, by **A. Moore Hogarth.** London : Hutchinson & Co., 127 pp., 3/6 net. It seems difficult to realise that there are about a thousand different species of mosquitoes known, and that in Great Britain there are no fewer than 26 species, some of which have been known to give fatal results to the human beings whom they have poisoned. Mr. Hogarth's volume illustrates and describes the life histories of these, and explains the best way and best time to wage war against them.

How Animals Find their Way About, by **Etienne Rabaud.** London : Kegan Paul, Trench, Trubner & Co., ix.+142 pp., 7/6 net. The Professor of Experimental Biology in the University of Paris refers to Flying Insects, Walking Insects, Termites, Molluscs, and other species. He also deals in this connection with what is done by sight, smell, touch, etc. Memory also plays an important part in some instances. Mr. I. H. Myers has translated these interesting chapters, which are illustrated, and we can recommend the volume to the field naturalist who desires to get information not to be found in ordinary text-books.

Realities of Bird Life, by **Edmund Selous.** London : Constable & Co., xvi.+351 pp., 14/- net. Mr. Edmund Selous is well known to our readers, and our pages have been occupied by his careful diaries of observations on various aspects of bird life. *The Zoologist* and *Wild Life*, two publications no longer with us, and *The Naturalist* have recorded Mr. Selous' work previously, and these and many other observations are now gathered together, where they will be welcomed by the true field naturalist.

Studies in Hereditary Ability, by **W. T. J. Gun.** London : G. Allen & Unwin, 288 pp., 10/6 net. Mr. Gun has been to extraordinary pains to show that a strain of exceptional ability can be traced through a number of generations in different important families. In the case of many well-known English and American people he has obtained details of the descendents of important people, showing that, in many cases, certain characters have been most marked. The author takes us back even to the fifteenth and sixteenth centuries, and among the subjects of his essays are well-known naturalists, statesmen, literary men, engineers, and others ; and an index of personal names which is marvellous in its extent. To the student of heredity, as well as of family history, this volume should strongly appeal. We fail to find any reference to Jack Sheppard.

The Evolution and Classification of Soils, by the late **Dr. E. Ramann.** Cambridge : W. Heffer & Sons, xii.+128 pp., 7/6 net. It is always well to know the views of important scientists abroad on matters of general interest. Consequently, English students of botany, geology and chemistry will thank Dr. C. L. Whittles and Messrs. Heffer & Sons, the translator and publishers, for bringing before them, in English, the late Dr. Ramann's well-known work, published at Munich in 1917. The translator has made additional notes and references, principally relating to English literature.

The Geographical Distribution and Status of Birds in Scotland, by **Evelyn V. Baxter** and **Leonora Jeffrey Rintoul.** Edinburgh : Oliver & Boyd, viii.+425 pp., 15/- net. As our readers will know, the two ladies responsible for the present substantial volume have for many years been contributors to *The Scottish Naturalist* on the status of different species of bird life, and the results of these researches are now summarised. The author's method is shown by the following, taken from the Introduction :—' When a bird has more than one status in the same place, this is shown as far as possible. For instance, the British Song Thrush is to some extent resident, but many leave us in autumn and return in spring, and so are summer visitors. The status in many cases is quite sufficiently worked out, and much observation and recording are necessary before the geographical distribution and status of Scottish birds can accurately and fully be detailed. When a bird is a rare, or very rare, visitor, we have given the reference to the first occasion on which it has been recorded in each country, or part of a country.' As a rule, a page is devoted to a particular species, with a list of the counties in which it has been recorded, though in most instances the pages are remarkably similar. For example, the Aquatic Warbler on page 112, which is described as a very rare visitor, has practically the same list of countries to its credit as has the Icterine Warbler, a rare visitor, the only difference being a few brief references to early visits.

African Jungle Life, by **A. Radclyffe Dugmore.** London : Macmillan & Co., viii.+246 pp., 15/- net. This volume, printed in large type and illustrated by coloured plates by the author, deals with the Elephant, Lion, Buffalo, Rhinoceros, Giraffe, etc. The chapters are written in an interesting manner, are devoid of technical language, and it is a particularly suitable book for young readers.

Plants of New Zealand, by **R. M. Laing** and **E. W. Blackwell.** London : Whitcombe & Tombs. xv.+468 pp., 18/- net. This admirable photographic record of the principal features of the New Zealand Flora, supplemented by descriptions of the various species, has reached its third edition, which speaks for its popularity. It has been enlarged and revised, and is a useful record of one aspect of the natural history of our interesting Dominion.

Ancient Civilizations, by **Donald A. Mackenzie.** London : Blackie & Son, xx.+283 pp., 12/6 net. After having previously dealt with ' Early Man in Britain,' Mr. Mackenzie now goes further afield and gives interesting accounts of ancient civilizations from the earliest times to the birth of Christ. He introduces us to The Dawn of Civilization ; Egypt's Golden Age ; Cretan Civilization ; Early Minoan Culture ; Early Mesopotamian Civilization ; Rise of Assyria ; Persia's Great Empire ; Empire of Athens ; Empire of Alexander the Great ; The Early Indian Empire ; The Early Chinese Empire, and others. The volume is illustrated by a large number of plates and maps.

Adventures in the Big Bush, by **Cyril Grant Lane.** London : Hutchinson & Co., 287 pp., 18/- net. The author gives a racy account of the Australian Aborigines, who claimed him as a ' brother,' with an account of the Ethnology, Fauna, Flora and some of the more remarkable incidents met with during his visit. He deals with equal ease with the natives, trees, birds, snakes, etc., and his volume makes interesting reading. It may be prejudice on our part, but we do not like a book to begin with a photograph of the author, although he is 'Wearing the tie worked by the Indian Prince's little daughter.' Other illustrations are 'The Boys who first convinced the Author that Lilystems were good to eat'; 'The Great Snake which tapped the Author's head'; 'Waterfall, photographed for the first time by the Author' (which may have been photographed previously); 'Dug-out Canoe in which the Author often paddled alone at night,' etc.

Roman Coins, by **Harold Mattingly.** London: Methuen & Co., xx.+300 pp., 21/- net. Nearly half of this volume is taken up by a remarkable series of collotype plates, showing the various types of Roman coins in circulation from the earliest times to the fall of the Western Empire. As Assistant-keeper in the Department of Coins and Medals at the British Museum, the author has unrivalled opportunities for carrying out a work of this nature, and all numismatic students will be grateful to him for having taken advantage of these opportunities. Possibly in no other way could the fine series of casts of Roman coins be prepared from which the illustrations have been printed. The growing number of students of history, and particularly that aspect of it relating to Roman coinage, will welcome this admirable book.

Portchester Castle, by **J. H. Cooke.** Southsea: the author, 23 Salisbury Road, vi.+159 pp., 5/- net. Many years ago the writer of this volume, as he reminds us, contributed geological notes to *The Naturalist.* He now seems to have devoted his energies principally to historical, archæological, and architectural matters, and gives a series of well-illustrated articles dealing with Portchester Castle and district in their different aspects. They have apparently originally appeared in the local press, and have now been reprinted, and will be welcomed in this form by those interested.

To celebrate the fiftieth anniversary of the John Hopkins University, 'Studies in Geology No. 8,' edited by E. B. Mathews, dealing with **Fifty Years' Progress in Geology, 1876-1926,** has been published. (The John Hopkins Press, Baltimore, Maryland, U.S.A., 161 pp.). While naturally dealing more particularly with the question from the University's standpoint, there are chapters which will appeal to general students. Unfortunately, two important manuscripts were not ready in time for publication, and appear in title only. The chapters deal with 'Contributions of Hopkins to Geology,' by W. S. Bayley; 'Geology at Work,' by G. Otis Smith; 'Fifty Years of Progress in Petrography and Petrology,' by Florence Bascom; 'Fifty Years of Petroleum Geology,' by D. W. Ohern; 'Progress in Ore Genesis Studies,' by B. Le Roy Miller; and 'Progress in Structural Geology,' by E. B. Mathews.

Practical Hints to Scientific Travellers (Vol. V.), edited by **H. A. Brouwer.** Martinus Nijhoff, The Hague, Holland, 173 pp., 8/6. With the exception of Chapter 3, this book is printed in English, and is the result of the personal experiences of different travellers in Ecuador, Eastern Congo, Malay Peninsula, Manchuria, etc.; its object being more to acquaint would-be travellers with his probable difficulties and requirements, than an actual recital of methods of collecting.

Field, River, and Hill, by **Eric Parker.** London: P. Allan & Co., Ltd., x. + 280 pp., 10/6 net. Mr. Parker has gathered together various essays which have appeared in sporting and other papers, and has had the advantage of making the use of some excellent dry-point illustrations by Miss Winifred Austen. The book deals first with various aspects of sport in England, Scotland and Ireland; then with the River, Lake, and Sea; which is followed by a Diary of Sports of various descriptions, between August and January; and closes with notes on the Choice of Guns; Companions of the Butt; Clays; and A Hostess of the Moor. The volume is very well produced, and is an artistic, as well as a general success.

1928 July 1

The Haunters of the Silences, by **Charles G. D. Roberts.** London: T. Nelson & Sons, 255 pp., 2/6 net. Previously this author has devoted his attention to the mammals and birds of New Brunswick. He now refers to other animals, including many strange denizens of the deep, but all through, his stories are exceedingly fascinating.

The Origin of the Species, by **Charles Darwin.** Messrs. G. Allen & Unwin are to be congratulated in issuing this volume as No. 811 of their Everyman's Library at the small price of 2/- (xxiv.+488 pp.). In addition to the book itself, there is an admirable introduction by Professor Sir Arthur Keith, a complete list of Darwin's published volumes, additions and corrections to the text in successive issues of the work, and a historical sketch.

——:o:——

M. V. Lebour writes on ' The Life Histories of Pea-Crabs ' in *Discovery* for June.

In *Antiquity* for June, Eliot Curwen has a paper on ' Ancient Cultivations at Grassington, Yorkshire,' with a plan.

In *The Entomologist's Monthly Magazine*, B. S. Williams withdraws *Oxypoda vicina* Kr. (*humidula* Kr.) from the British list, due to improper identification.

In *The Colliery Guardian* for June 1st, D. Macgregor writes on ' Alteration in the Composition of the air contained in a sealed-off area in the Barnsley bed.'

In *The Museums Journal* for June is a notice of a certain Museum and Art Gallery, and the editor calls it the ' Report of the . . . Committee.' We know a committee like that.

F. V. Theobold gives ' Notes on Hop Insects in 1927,' in *The Entomologist* for June. In the same journal, W. P. Quaggan records *Leucania extranea* (*unipuncta*), in The Isle of Man.

T. H. Taylor writes an illustrated paper on ' The Watercress Stem-miner,' in *The Entomologist's Monthly Magazine* for June, and in the same issue J. E. Collin describes a new species of *Hydrellia* (Diptera, Ephydridæ) mining the stems of watercress, sent to him by T. H. Taylor. K. G. Blair contributes notes on the Insect Fauna of the Isle of Man.

A writer in *The Beverley Guardian*, in connection with some celebrations which should be arranged at Beverley, suggests, among other things, that: ' There must be a display of town documents and civic treasures in the enlarged Museum. (These must be guarded against the straightforwardly piratical tendencies of Museum Curators in the district.).'

In the *Bergens Museums Arbok*, 1927, Astrid Karlsen contributed a paper in English on ' Denitrification in Uncultivated Soils.' In the same publication for 1928 a summary, also in English, is given of an excellent paper dealing with the Geology of the district between Nordfijord and Sognefjord on the coast of Western Norway.

The Annals of Archæology and Anthropology, issued by the University of Liverpool (Vol. XV., Nos. 1-2), just received, contain three papers of particular interest to northern antiquaries. These are, ' Report on the Excavations on the Site of the Roman Fortress, at the Deanery Field, Chester,' by Robert Newstead; ' Trial Excavations at Lancaster,' by J. P. Droop and R. Newstead; and ' Excavations at West Derby Castle, Liverpool,' by J. P. Droop and F. C. Larkin.

The Sixth Annual Report of the Worthing Archæological Society contains two valuable papers relating to the occupation of Sussex during the Bronze Age. This wealth of Bronze-age material is doubtless due to the fact that its easy access from Brittany resulted in traders coming from the continent, resulting in the abnormal number of hoards of Bronze-age Implements which have been found in the district. One of these essays relates to a hoard of bronze axes, found during the present year; the other deals with Worthing three thousand years or so ago.

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PRINCIPALLY FOR THE NORTH OF ENGLAND.

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F.S.A.(Scot), F.R.A.I., M.B.O.U.,
The Museums, Hull;
and T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Tolson Memorial Museum, Huddersfield,
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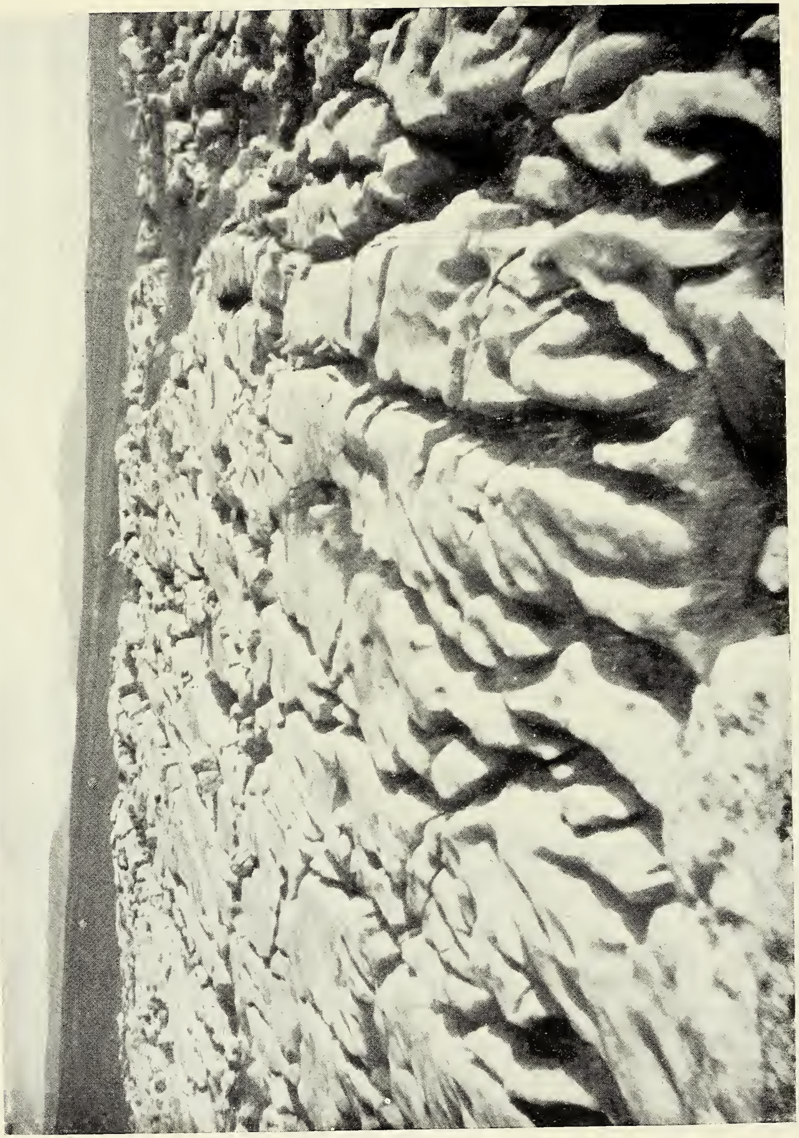

Photo by] ‘Grikes’ in D_1-Limestone of Malham. [*J. Ranson.*

NOTES AND COMMENTS.

GEOLOGISTS IN THE WESTERN PENNINES.

The Proceedings of the Geologists' Association, issued on June 25th (price 5/-) are principally occupied by accounts of the various districts recently visited by the Association. One of these deals with the successful excursion to the Western Pennines, which is reported upon by J. Ranson, J. Holmes, J. Spencer, V. Dean, D. Parkinson, R. L. Sherlock, W. Lloyd, R. G. S. Hudson, Miss K. Booker and E. W. J. Moore. This is well illustrated by a number of excellent photographs, one of which we are kindly permitted to reproduce. (Plate V.).

A NINE-FT. CLAW.

We take the following from the only paper likely to publish such a story. We are not quite sure whether the ' ft.' stands for foot or feet—with a claw like that ! :—' Mammoth's 9 ft. Claw Found (from our own correspondent). Constantinople. Excavations in Transcaucasia, Russian Armenia, have brought to light a prehistoric mammoth's claw, nine feet in length, with a sharply hooked tip. It is the seventh toe of a mammoth to be found in Armenia in the past decade. The jaw of an animal of the bovine species twice the size of the present-day cow has also been unearthed. The theory advanced is that these monsters were drowned in a flood.'

MORIBUND UNIVERSITIES.

We take the following from a recent issue of *The Yorkshire Post* :—' Some strong criticisms of the administration of the modern provincial Universities and the constitution of their councils was offered at the York Rotary Club by Dr. W. E. Collinge, the curator of the Yorkshire Philosophical Society's Museum at York, in an address on " The need for University Reform." Mr. Collinge, who is an M.Sc. of Birmingham, and a D.Sc. of St. Andrews, prefaced his address by saying that his observations had no reference to Oxford or Cambridge, of which he had no personal knowledge. In the opinion of many people the Universities were not playing the part they might do. " Some are moribund," he said, " almost derelict, others apathetic, whilst there are one or two that seem to exist primarily for the professors and not for the students. Few are homes of learning or research. In all the cost of upkeep is enormous." Over thirty years' daily experience in Universities had impressed on him many of their shortcomings as regards the governing body, the teaching staff, and the general management. " New Universities are springing up all over the country, and one seems to vie with the other for numbers—for quantity rather than quality. Every year we are drafting large numbers of young men and women into these institutions, and many of them are unfitted for a higher education, and each one costs the foundation something between £50 and £78 per year." ' Were we getting value for our money ; was the money being rightly and judiciously expended ?

CRAVEN ANTIQUES.

Under the above heading, recent additions to the newly-formed Skipton Museum are recorded. These include :—' The ancient key of Barden Tower, and a bone spear-head found in a rabbit warren near Watergate, Barden, lent by Nurse Lister. Mr. Ross Butterfield, Keighley, has contributed a Roman bronze falstave (*sic*) found at Drebley, Bolton Abbey, and an early bronze celt found at Cowling has been lent by Mr. John Stell. The Bronze Age is illustrated by the collection lent by Mr. John Sunderland, of Ashgarth, Skipton, including a Roman bronze celt, untrimmed, a Roman bronze stamp found at Kirkstall ; half a dozen bronze lamps, and a Roman bronze safety pin. Illustrating the Stone Age, from the same collection, are neolithic and palæolithic flints, and a fine example of a stone hammer, manufactured by a notorious "antique" forger, known as "Flint Jack," who duped museum authorities and private collectors all over the country in the 'seventies.'

THE PASSING OF WILD LIFE.

Under the above heading, the Society for the Preservation of the Fauna of the Empire (c/o The Zoological Society, Regents Park, London) has issued a timely pamphlet. Referring to extinct and rare species, it is recorded that ' In Africa many have already been wiped out. Among them are the Blue Buck, Burchell's Zebra, the Quagga, and it is common knowledge that many other species, including the Gorilla, are in pressing need of protection. In Canada we find the same miserable story. The Passenger Pigeon was wiped out of existence by a trade interest in a few years, in spite of the fact that its numbers are said, when great flocks passed, to have darkened the sky. The Great Auk, the Dodo, Steller's Sea-Cow, the Giant Land Tortoises, were swept away by the early mariners. Only at the very last moment was the Bison saved from extinction. The Musk-Ox (as a wild species) is almost gone. The Wapiti, the Caribou, the Moose, are all retreating, and have only been saved now by stringent protection. The Polar Bear is scarce, the Grizzly Bear, according to Thompson Seton, "has retreated to secluded fastnesses. . . . He has changed in temper as in life, and the faintest whiff of man-scent is now enough to drive him miles away.'

PIONEERS OF PLANT STUDY.*

This volume was planned, and some part of it written in collaboration with the late G. S. Boulger, but its progress was interrupted by the war, and later by Prof. Boulger's death. The work is an interesting outline of plant knowledge as it has been gained through the ages by the devoted labours of men responsive to the voice of nature and fascinated with the mysteries of life. This story of slowly acquired plant lore is brought from the earliest times down to the nineteenth century, and gives outlines of the careers of those leaders of botanical science who gleaned from the open fields of Nature, knowledge of the life that clothed those fields with

Carolus Linnæus (1709-1778).

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* By Ellison Hawks. Sheldon Press, pp. x.+288. Price 12/6 net.

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beauty and made them fit for the pleasure and service of man. This story is told in thirty-eight chapters, and illustrated by fifteen portraits, one of these of Carolus Linnæus (1707-1778) we are able to reproduce. 'No one previous writer,' says the author, 'mentions half the number of plants enumerated by Pliny. His one surviving work, generally known as his *Natural History*, is almost entirely a compilation, and has been called a "repository of all the errors of antiquity."' Mr. Hawks appropriately adds another to the list when he refers his reader to Pliny's portrait (Plate 1b) which is inscribed "Plato (?426-347 B.C.)'!

MIGRATION OF LAPWING.

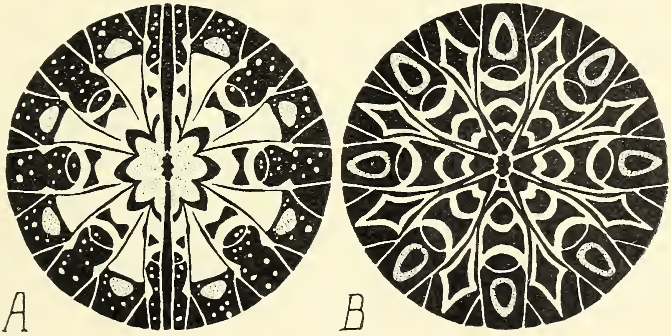
We learn from *The Scottish Naturalist*, No. 171, that 'The Lapwing has recently afforded an amazing instance of long distance migration. It is not an American bird, yet in December, 20 to 23 flocks of large size, numbering in one case about 500 individuals, and in another twice as many, appeared in Newfoundland. The birds were British birds, for one bore a *British Birds* marking ring, and had been born in Cumberland; and Mr. H. F. Witherby shows (*British Birds*, Vol. XXII., p. 6) that the migration was accomplished owing to a gale, blowing at 55 miles an hour, which carried the birds due west. It could only be during the most favourable circumstances that a relatively poor flier, like the Lapwing, could cover some 2200 miles at a stretch.'

BORROWDALE VOLCANICS.

At a recent meeting of the Geological Society of London, Mr. G. H. Mitchell read a paper on 'The succession and structure of the Borrowdale Volcanic Series in Troutbeck, Kentmere, and the Western Part of Long Sleddale (Westmorland). The area lies in the eastern part of the Lake District south of the High Street range. It is drained by the Rivers Sprint, Kent, and Trout Beck, all of which flow in a southward direction. Nine subdivisions are recognised in the rocks described. They have been subjected to severe earth movements. Two systems of folding are recognised, an earlier one of pre-Bala age and a later one of Devonian age. The former system, of simple character, shows axes trending in a north-north-easterly and south-south-westerly direction. In the latter the folding was intense, with an east-north-easterly and west-south-westerly strike, while the pitch of the folds are even overturned to the north. Northwards the folding is less severe, and is marked by the presence of a broad anticlinal fold. No faulting of earlier date has been recognised. The rocks are strongly cleaved, the strike of the cleavage coinciding with that of the Devonian folding.'

MARINE BIOLOGY.

We have before us the last two parts of the *Journal of the Marine Biological Association* (Vol. XV., Nos. 1 and 2), which between them contain over 730 pages, each full of records of valuable work accomplished by the Station or by its students. Of exceptional importance is Dr. J. H. Orton's paper on 'Rhythmic Periods in Shell-growing in *Ostrea edulis*, with a Note on Fattening.' Others are, 'British Edwardsidæ,' by O. Carlgren and T. A. Stephenson; 'The Life History of *Thysanoessa raschii*,' by R. Macdonald; 'The Identification and Validity of Certain Species of Ascidians,' and 'The Ascidian Fauna of the Plymouth Area,' both by N. J. Berrill; 'Nitrate in the Sea,' by H. W. Harvey; 'The Preservation of Fishing Nets by Treatment with Copper Soaps and other Substances,' by W. R. G. Atkins; 'Herring Investigations at Plymouth,' by E. Ford; 'Studies on Conditioned Responses in Fishes,' by H. O. Bull; 'Physical Factors on the Sandy Beach,' by J. R. Bruce; 'The Larvæ of *Polydora ciliata* Johnston and *Polydora hoplura* Claparede,' by D. P. Wilson; 'Lunar Periodicity in Reproduction of *Pecten opercularis* near Plymouth in 1927-8,' by C. Amirthalingam; and 'Notes on the Biology of *Tellina tenuis* Da Costa,' by A. C. Stephen—though we have only mentioned a small proportion of the numerous papers published. The accompanying illustration is, by permission, taken from the paper on 'The British Edwardsidæ.'



Diagrammatic representations of the pattern on the disc and tentacle-bases in *E. callimorpha* (*A*) and *E. delapiæ* (*B*). Only the lowest parts of the tentacles are shown. The shaded markings on the tentacle-bases are aboral, and are visible because of the transparency of the oral sides of the tentacles. The vertical dark stripe in *A* is a band of colour affecting the directive tentacles and radii. In *B* the aboral markings are omitted from the exocœlic tentacle-bases. X.ca. 6-7.

THE SCENERY OF WILD NATURE.

Under this heading, in the summer number of *Geography*, Dr. Vaughan Cornish refers to the Response to Climatic and Local Environment. He says, ' One day during the spring tides of September I took up station on the left bank of the Trent opposite to Burton Stather at six in the evening, the water being then very low in the river and current imperceptible. At nine minutes past the hour a roaring sound was heard rapidly approaching from the direction of the Humber, and almost immediately a long ridge of foaming water a foot high (the incoming tide behind level with its top) was seen advancing quickly and steadily over the bare sandbank, the beginning of the Ægir, or bore, which travels up the Trent, at first increasing in height as the river narrows, ultimately diminishing from loss of " head." Outstripping the advance of the tide by means of a motor car, I was able to take up station on the jetty at West Butterwick, ten miles above Burton Stather, in time for the arrival of the Ægir, which is seen here in full development. The front was a group of some fifteen waves stretching from bank to bank, the first about five feet in height cusped as a wave of the shore when on the point of breaking, but this wave charged on into still water unbroken, though its cusp was so delicately poised that its maintenance was a marvel. Two minutes after the passage of the group of high, steep waves, giving a steely reflexion in bars from bank to bank, there arrived a second group, like them, but not so high, the rearguard of the Ægir. Behind this the current of the flood tide set in with full swiftness. The tide ebbed and flowed again during the night, and the last ebb of the " springs " had just begun when I took my station on the jetty at Burton Stather next morning in misty sunshine. The river had not been able to discharge all the water driven in during the last few days by the strong pulsation of the sea, and the banks were flooded. In the estuary of the Humber the level had already fallen, so that the surface slope conformed with the slope of the bed of the river ; thus there was no longer a conflict of natural forces, and the broad waters swept smooth and silent to the sea.'

THE HUXLEY-WILBERFORCE DEBATE OF 1860.

In *Nature*, No. 3056, we find that ' The Huxley-Wilberforce debate at the Oxford meeting of the British Association in 1860 has come to be regarded as a classic encounter in the progress of modern scientific thought, typifying the overthrow of rhetorical distractions, prejudice, and intolerance in face of cool reason. On all hands the effectiveness of Huxley's closing words were admitted, and it is strange that in spite of this unanimity, no member of that memorable audience could recollect the exact terms of his overwhelming retort to the Bishop of Oxford. Prof. E. B. Poulton's contribution to the *Jesus College Magazine* Lent Term number, therefore, makes some welcome additions. He shows us that Huxley was present at the meeting against his own inclination, and quotes several versions of the encounter, revealing that the article in *Macmillan's Magazine* for October, 1898, was written by Mrs. William Sidgwick. But the most accurate account is that contained in the letter from J. R. Green, who had just graduated B.A., to his college friend, now Sir William Boyd Dawkins. (It is amusing to picture this doyen of British prehistoric archæologists "chucking" a snowball through the glass of Green's window, as he confessed to the author he had done.)'

SIR WILLIAM BOYD DAWKINS' CONTRIBUTION.

'Green's letter was written three days after the meeting, and Prof. Poulton prints a communication from Huxley himself, written less than a year before his death, stating that in his opinion its account, with one emendation, was accurate. "I asserted, and I repeat, that a man has no reason to be ashamed of having an ape for a grandfather. If there were an ancester whom I should feel shame in recalling, it would rather be a *man*, a man of restless and versatile intellect, who, not content with [an equivocal] success in his own sphere of activity, plunges into scientific questions with which he has no real acquaintance, only to obscure them by an aimless rhetoric, and distract the attention of his hearers from the real point at issue by eloquent digressions and skilled appeals to religious prejudice." We have placed in parentheses the words which Huxley considered he did not use. Sir William Boyd Dawkins has expressed his intention of presenting the letter from which the above is a short extract, together with others of the deepest interest, to the archives of Jesus College, Oxford.'

THE VOLCANIC COMPLEX OF CALTON HILL (DERBYSHIRE).

At a recent meeting of the Geological Society of London, Mr. S. I. Tomkieff read a paper in which he stated 'that the volcanic complex of Calton Hill shows two phases of vulcanicity :—(i) Effusive phase—represented by, besides the agglomerate and tuff of the old volcanic cone, a highly decomposed lava. Petrologically and chemically it is comparable with the other contemporaneous Lower Carboniferous lavas of the district. The vesicles are filled up with a chlorite of delessite type. (ii) Intrusive phase—represented by a fresh analcite-basalt, which has intruded into the old volcanic chimney and spread amœba-like in the volcanic cone, detaching large masses of vesicular lava. Besides abundant analcite,

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mostly in the form of spheroids, the basalt contains numerous inclusions of peridotite. These inclusions, apparently represent shattered fragments of a pre-existing rock, and contain, besides the normal pyroxene, a definite hydrous augite.

THE ST. HELENS MUSEUM.

The Forty-ninth Annual Report of the Committee of the Public Libraries and Museum, 1926-7, of St. Helens, includes the 'Museum Report' as under:—'The most important gift to the Museum during the year has been thirty-five mounted specimens of British and Foreign birds from the Corporation of Bootle. An additional large show-case has been purchased, the plate glass for the case being a gift from Councillor Guy Pilkington. Forty-two specimens of birds have been placed in the show-case, including most of those received from the Bootle Museum. Three further specimens of British birds have been presented by Mr. Linnæus E. Hope, Carlisle, to supplement the twenty-three specimens previously presented by him. Lists of books in the Central Lending Library, bearing on the various exhibits, including geology, mineralogy, conchology, corals, Egyptian antiquities, and others, have been placed in their respective show-cases.'

A HARROGATE MUSEUM.

We take the following from *The Yorkshire Post*:—'The gift to the Harrogate Corporation of a collection of curios by Miss Walker, of Harcourt House, Harrogate, formerly of York, forms an acceptable nucleus for the museum which will probably be a part of the extension to be made by adding a storey to the Central Library. The curios have been gathered by Miss Walker from Japan, China, Turkey, Africa, Canada, Italy, and Norway. Among them is a cocoanut box covered with wonderful tortoise-shell, and another striking object is a shark's tooth dagger. Mr. A. W. Bain, a former Lord Mayor of Leeds, and father of Sir Ernest Bain, has given to Harrogate a collection of coins, about 300 in number; and another valuable gift, from an anonymous donor, is a library of music.' Possibly, at last, Harrogate is rising to its responsibilities in this matter, but it is now rather late in the day, as in recent years many valuable collections made by Harrogate people have been sent to other Museums and Galleries in the country, where they will remain. Judging from the offers already made, it would seem that if the Harrogate Corporation is seriously considering the question of a museum, the first thing it should do is to get a Curator.

'ARCTIC' PENGUINS.

It is not often there is much humour in a second-hand book catalogue, but one just received, in offering for sale drawings of 'Old Sailing Ships and Birds,' we are informed they are done 'in masterly style,' and represent 'a snowy corner of the Arctic where Walrus and *Penguin* ! reign supreme.' This must be an odd sight ! Following on, we learn that 'Of the birds, one we take to be the Kittiwake gull (no hind toe) ; the other a little ocean bird we are unable to identify, but roughly speaking, we may describe it as having the body of a petrel, web feet, a robin's head, a buzzard's beak, and a long bifurcated tail with a suspicion of beard that adds age to his character.'

THE SELBY MUSEUM.

In a recent issue of *The Selby Times* is a special article in reference to the centenary of the birth of Sir Jonathan Hutchinson, F.R.S. Sir Jonathan was the founder of the Hazlemere Educational Museum and of the Selby Educational Museum, and had original, if not altogether practical, ideas on the classification and arrangement of museum specimens. His collections were left to Selby without any conditions whatever, which is perhaps unfortunate, as in his *Report on the Museums of the British Islands*, Sir Henry Miers states : 'Selby, which was initiated by Sir Jonathan Hutchinson, has fallen into neglect, and is one of the worst examples in the country of a decayed institution, though it still bears the word "Educational" on its front.'

RACIAL CHARACTERISTICS.

T. W. E. Higgens, author of "Hebrew Idolatry and Superstition," has produced a small volume dealing with the racial characteristics of the people of England*. He deals with different counties, and our readers will perhaps form an idea of the nature of the book if we quote what is stated about 'York' :—'York.—The population may be divided into three main types :—First : The tall, broad-shouldered, grey or blue-eyed man with stalwart limbs, yellowish hair and open face. This type is Anglian or Anglo-Danish. Second : A type less bulky, but still tall, with dark eyes and brown hair and dark complexion, and with an intense expression, not usually found in the Anglo-Saxon. These people may be descended from the darker tribes which seem to have come over with the Danes. Third : The short, dark, Mediterranean type. The first two types are found in the North and East Ridings, the last type in the West Riding, which is a dark district. About the range of hills dividing Lancashire from Yorkshire the people are rather short, lithe, sinewy, quick moving, and fertile in ideas and imagination. In the plain of York we find the short, dark type. At Runswick the coast population, with their rugged speech, blue eyes, sun-burned and tanned skins, show their near kinship with the Danes. In Bradford, much Norfolk blood was introduced in the earlier part of the 19th century to work in the mills. A large number of tramway conductors were observed there in 1903. The majority were medium dark, but more dark eyes than hair were noticeable; but taking the town generally the people could not be described as dark. Dr. Beddoe noted that about Leeds the prevailing type has an oblong or rather narrow trapezoidal head, inclined to be broad rather than narrow, with a vertical forehead, smooth brows and a straight profile; with a straight, though sometimes concave, nose. He considers the type Anglian. Light hair was prevalent there, and also in the mountainous regions to the north and south. Some Flemings are said to have settled at Halifax, and to have influenced the dialect in those parts. Between Doncaster and Goole there is a Dutch colony near Thorne of short, stolid, square-faced, low-browed people who came over about forty years ago. The inhabitants of Flamborough are a distinct people, who keep to themselves; intermarry, and are all related. In the West Riding the villages are of the Celtic type.'

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* London : R. Scott, 93 pp., 2/6.

CLASSIFIED GEOLOGICAL PHOTOGRAPHS.*

This list of Classified Geological Photographs, arranged under subjects, has been compiled from the set of geological photographs taken by the Geological Survey during the last thirty years in the course of its work in Great Britain. The complete set of photographs, numbering over 7000, is preserved and may be consulted in the albums deposited in the libraries of the Geological Survey and Museum, 28 Jermyn Street, and the Scottish Office at Southpark, 19 Grange Terrace, Edinburgh. The present list has been prepared to help teachers and the public in general to a proper and rapid selection of the more interesting and striking photographs of which copies, either prints of lantern slides, may be desired. The general headings are, 'Weathering and Atmospheric Action,' 'Rock Structures,' 'Action of Rivers,' 'Glacial Action,' 'Marine Erosion,' 'Igneous Rocks,' 'Stratigraphical and Industrial.'

THE INTRODUCTION OF CIVILIZATION INTO BRITAIN.

The recently published *Journal of the Royal Anthropological Institute* contains Mr. H. J. E. Peake's Presidential Address, with the above title. The President concludes: 'In this address I have endeavoured to examine the present position of our knowledge of the earliest civilization in the west of Europe, and I have put forward, very tentatively, a suggestion as to how the arts of agriculture and pot-making may have reached this country from those centres in Spain and Portugal, at which the elements of civilization arrived by sea from the Near East. Many of the links in my chain of argument are inferential, and I am quite conscious that, until these have been filled in by ascertained facts, the thesis must remain hypothetical. Before the hypothesis can be proved, we need to find other sites of the Windmill Hill type, nearer to the coast, that we may ascertain in what region these bearers of civilization landed. We need, too, more illustrations of the pottery already found, published with the thoroughness and careful attention to detail so conspicuously displayed in the account of the West Kennett pottery recently produced by Mrs. Cunnington. We need, too, in conjunction with our French colleagues, to make a more thorough survey of the sites and pottery of the neolithic civilization of the flint culture in the north-east of France, and of the earliest of such sites in Burgundy. When this has been done we shall be able to judge how far my suggestions are correct, and perhaps to trace the exact course by which civilization spread from Spain to Britain.'

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* H.M.S.O., iv. + 76 pp., 1/- net.

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FIELD NOTES.

Sinistral Helix pomatia L.—With reference to my notes on records of *Helix pomatia* L. monstr. *sinistrorsa* in *The Naturalist* for June, p. 186, I see that at the meeting of the Conchological Society, held at the Manchester Museum, October 1st, 1927, a living sinistral specimen from chalk-pits at Coulsdon, Surrey, 1927, was exhibited by Mr. Fred Taylor (*Journal of Conchology*, Vol. XVIII., No. 6, December, 1927, p. 182).—HANS SCHLESCH.

Golden Plusia Moth in the Isle of Man.—On the 24th July last year (1927), I netted a fine specimen of the Golden Plusia (*Plusia moneta*) in flight outside a lighted window. On recently comparing records at the Manx Museum, Douglas, I find that this is the first recorded occurrence of this moth in the Isle of Man. On the 26th of May in the same year, my brother, Mr. H. S. Cowin, obtained a melanic specimen of the Peppered Moth (*Pachys betularia* ab. *doubledayaria*) under a gas lamp in Douglas.—W. S. COWIN, 'Kenwood,' Brunswick Road, Douglas, Isle of Man.

Alpine Hare in Lancashire.—Referring to the note on page 168 of the June issue :—These Hares were introduced into Yorkshire in the neighbourhood of Greenfield in 1867. They did not, however, flourish, and gradually disappeared. In 1880 about fifty more were brought from Scotland and liberated ; these were more fortunate, and increased to such an extent that they gradually spread over the surrounding moors and hills, eventually penetrating into the neighbouring hills of Cheshire, Derbyshire and Lancashire. They are now quite common over a wide area of rough hilly ground. Mr. H. B. Booth recently visited their haunts and reported that they were very plentiful and apparently very sluggish in their movements.—R. FORTUNE.

Coleoptera near Wigton.—*Subcoccinella 24-punctata* is fairly common. *Adalia 2-punctata* and *Coccinella 10-punctata*, a few of each. *Halyzia 22-punctata* is common at Kelsick, Aikshaw Moss, etc., chiefly on Nettle. *Rhizobius litura*, common, Lesson Hall, Kelsick, etc. *Coccidula rufa*, Oulton Moss. *Ephistemus gyrinoides*, in flood refuse from River Waver. *Attagenus pellio*, house in Kelsick. *Mycetia hirta*, one in cut grass, Kelsick. *Choleva tristis*, one by beating low herbage. *C. fusca*, one in garden refuse. *Lathridius lardarius*, Kelsick, not common. *Meligethes æneus*, *M. viridescens*, *M. lumbaris*, *Epuræa æstiva*, and *Byturus tomentosus* were abundant in Hawthorn flowers. From my grass heap in the garden I obtained *Cryptophagus scanicus*, *C. setulosus*, *Atomaria atricapilla*, *A. fuscata*, *Enicmus transversus*, *E. minutus*, *Coninomus nodifer*, *Scydmænus collaris*, etc., *Brachypterus pubescens* and *B. urticæ* were very plentiful on Nettles, as was *Micrambi vini* on Furze.—JAS. MURRAY, Gretna.

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The Transactions of the Institution of Water Engineers, Vol. III., recently received, contains several papers of interest to Yorkshire geologists, viz., Scarborough Waterworks, by H. Richardson; The New Irton Water Scheme, by H. Lapworth; The Geology of the Scarborough District, by R. S. C. Waters, and Pre-cementation of a Reservoir Trench, by J. R. Fox.

The Annual Report of the Yorkshire Philosophical Society for 1927 informs us that their 'million shilling' fund, in order to replace bronze cases for the wood ones, has had a gratifying response, but more help is needed. Mr. C. E. N. Bromehead illustrates and describes an Anglican Glass Vessel in the museum which was found on the Mount, York, in 1807. A similar vessel was found at Alfriston, Sussex. Mr. A. W. Ping records *Gladiolus communis* on Strensall Common.

The Transactions of the Cumberland and Westmorland Antiquarian and Archæological Society, Vol. XXVII., recently issued, contains several important papers bearing upon the Society's sphere of operations. Among them are 'The Exploration of the Sunbrich Disc Barrow,' by J. Dobson; 'The Exploration of Bonfire Scar Cave and Dobson Cave, near Scales in Furness,' by W. G. Atkinson; and 'Notes on Recent Finds in Eskdale,' by Mary C. Fair.

'Some Sponges of the South-west Coast,' by G. P. Bidder; 'Insect Casuals and Migrants,' by C. W. Bracken; 'Lundy,' by W. N. Bolderston; 'The Birds of Lundy,' by A. H. Rousham; 'Notes on the Geology, Botany, and Zoology of Lundy,' by A. O. Rowden, together with reports of the sections, appears in *The Annual Report and Proceedings of the South Western Naturalists' Union* recently to hand. But why copy the glaring red cover of the *South Eastern* Naturalists' Union?

YORKSHIRE MARINE ZOOLOGY.

J. A. STEVENSON.

THE following notes relate to the period since January 21st, when my last ones appeared, and the present.

At the beginning of the year, a sponge, *Ficulina ficus*, was very common off the coast, but since then it has almost disappeared. It is new to the local records.

Another sponge, *Polymastia robusta*, is also comparatively common off the coast, and a new record.

The following species of Polyzoa and Hydrozoa are additions to the records of this district :—

Of Hydroids :—*Sertularia cupressina, Diphasia fallax, D. rosacea, D. tamarisca, Schizotrycha frutescens, Eudendrium rameum, E. ramosum, Halecium halecinum, Campanularia dumosa, C. verticillata* and *Thuiara articulata.*

Of Polyzoa :—*Eschara cribaria, Salicornaria farciminoides, Cellularia neritina, C. ciliata. C. reptans, C. ternata, C. hookeri, C. plumosa, C. avicularia, Flustra carbasea, F. avicularis, Tubulipora serpens, T. hispida* and *Loanthus couchii.* The names of these are taken from Johnston's 'British Zoophytes.'

While searching on trawlers' decks lately, I have once or twice come across a little prawn, the *Hippolyte thompsoni* of Bell's 'British Crustacea.' This is not in the local records.

On February 9th, 1928, I secured a specimen of *Cottus scorpius*, the Short-spined Sea Bullhead. Mr. Clarke has not seen it before, and it is not in the local record book. On the same day, my brother found a carapace of the rare Cranch's Nut Crab (*Ebalia cranchii*). This species was only added to the records last year.

On February 21st, I procured a fine specimen of *Trigla lineata*, the Streaked Gurnard, from the 'Expert,' which had been fishing off Whitby. This is the first that has been seen of this fish here for a very long time, in spite of the fact that it is marked 'common' in the 'Vertebrate Fauna of Yorkshire.'

A large northern Stone Crab was stranded alive on the rocks in South Bay, on February 27th. An ascidian, *Ascidiella opalina*, not in the record book, is common off the coast.

On March 17th, the crew of the Scarborough trawler 'Victoria' gave me an egg-case of the Lesser Spotted Dogfish, which had been bored and emptied by a whelk. There was an influx of this dogfish here at the beginning of the year, and this case had evidently been left behind when they went away. Normally the 'rough hound,' as it is called, is rare here.

On March 19th, Mr. Clarke was given a specimen of a large Squid, which had been picked up on the shore at Cayton Bay. On sending it to the British Museum, he discovered it to be a ' Flying Squid,' *Ommatostrephes sagittatus*, and new to this district. Since then, my brother and I have had a perfect deluge from the trawler men. They appeared to be quite common about thirty miles off shore, and rarely was a trawl shot without catching a few. Since then, they seem to have become rarer. They are, however, quite common as yet. Our largest specimen was 39½ in. in total length.

On March 24th, while on Filey sands after a storm, we found two specimens of a curious chætopod, *Ophelia limacina*, new to the district ; and on March 27th we procured *Nereilepas fucata*, another worm, which, though common here, was not in the local records.

To Mr. R. Jenkinson, of the ' Tyndrum,' is due the credit of a very good record on April 9th. He had a curious Squid for us, which, on identification at the British Museum, proved to be *Todaropsis eblanæ* (male). This is not only new to this district, it is but the second recorded instance of its occurrence in the North Sea. It is now in the British Museum.

On April 27th we secured an edible crab's left claw, the movable finger of which possessed two immovable fingers.

On May 1st I procured a very fine Common Topknot (*Zeugopterus punctatus*) from the trawler ' Euphony.' It was beautifully marked.

On April 26th, in a piece of the hydroid *Eudendrium rameum*, I obtained several specimens of an amphipod new to the district, which Dr. Calman, at the British Museum, identified as a species of *Jassa*.

On May 8th, from the ' Silver Line,' we procured a cephalopod, quite white, which proved to be *Rossia macrosoma*. But it was a very curious variety, several features in it differing from the normal type. Mr. Robson, of the British Museum, stated that it is the largest specimen of its kind that has ever been recorded, being just 10 in. in total length. Its mantle is nearly a cm. longer than the previous record. It was seined off Whitby.

On May 19th my brother had another good piece of luck. While searching on the ' Tyndrum's ' decks, he found a perfect little specimen of the crab *Eurynome aspera*, new to this district. We have now had it alive in a pie-dish for nearly two months, and it is doing well.

The Green Pea Urchin (*Echinocyamus pusillus*), though not mentioned in the records here, is quite common in deep water.

Unfortunately, I have mislaid the date when we procured a holothurian, *Thyone roscovita*, new to this district. It is in the British Museum now. I got it in May.

On June 16th, I secured an edible crab's claw, in which two immovable fingers were projecting upwards from the inner surface of the lower finger.

On June 19th I procured a specimen of the shell *Psammobia tellinella*, from off Robin Hood's Bay.

On June 24th, from the shrimpers in South Bay, I obtained a beautiful living specimen of the little cephalopod *Sepiola rondeletii*, which I kept alive for a week.

On the next day I found many specimens on the decks of the 'Tyndrum,' which had been off Robin Hood's Bay. They included a smooth-clawed Hermit Crab (*Eupagurus lævis*); four Pennant's Nut Crabs; a Dwarf Swimming Crab (*Portunus pusillus*) with purple spawn; a Northern Stone Crab only 2 mm. in total breadth; *Hippolyte thompsoni*; *Pandalus annulicornis*; and the Purple Heart Urchin.

On June 27th, I again procured one each of the first two of this lot from the same boat.

The last I have to record is the Three-spined Shrimp (*Crangon trispinosus*) of Bell's 'British Crustacea,' which, I have just discovered, is caught in considerable numbers by shrimpers in South Bay. It appears to be new to the records of this district.

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Half a page of *The Australian Museum Magazine*, No. 6, is devoted to an obituary notice of Edgar Ravenswood Waite, Director of the South Australian Museum, who was born at Leeds in 1866. 'His versatility and ingenuity made him one of our foremost museum administrators and workers.'

The *Journal of the East Africa and Uganda Natural History Society*, No. 30, contains important memoirs on 'The Butterflies and Birds of Kenya and Uganda'; 'Fishing in Lake Victoria'; and a note headed 'A Use for Ants' Nests,' which suggests that they are desirable to ward off the evil eye.

Natural History, the journal of the American Museum of Natural History, has issued a special African Number, in which Dr. Henry Fairfield Osborn writes on 'The Vanishing Wild Life of Africa'; and others also contribute. There are some wonderful illustrations in colours, and others from photographs.

In a note on 'Oilwells in Britain' in *Nature*, No. 3056, we learn 'the very remote possibility of finding a commercial oil-pool in this area, or in any other area in the British Isles for that matter, warrants no further drilling in Derbyshire nor elsewhere.' These sentiments appeared in our columns years ago.

The Journal of the Quekett Microscopical Club for May contains Dr. W. T. Calman's Presidential Address on 'Subterranean Crustacea'; Dr. W. B. Brierley writes on 'The Micro-Flora of the Soil'; C. C. Swatman on 'The Cleaning of Diatomaceous Mud Gatherings'; and E. Ashby on 'The Laws of Plant Growth.'

The summer number of *Geography*, among many other papers, contains 'Harmonies of Scenery,' by Dr. V. Cornish; 'Environment and Cultural Progress among Primitive Peoples,' by Dr. A. C. Haddon; 'The Geographer and the Study of Climate,' by Dr. M. I. Newbegin; and 'The Geographic Background to the Roman Occupation of Britain,' by J. Holmes.

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In Memoriam.

JOHNSON WILKINSON.

The members of the Yorkshire Naturalists' Union will learn with deep regret of the passing of Johnson Wilkinson, in his 87th year. He had long been associated with the Union, was keenly interested in the work of the Vertebrate Zoology Section, and, until quite recently, regularly attended their winter meetings, despite the fact that increasing deafness was a great handicap in following the papers read there. He was a valued member of the Wild Birds and Eggs Protection Committee, and for a number of years filled the office of treasurer to that Committee, only advancing age, and, particularly, his deafness, causing him, reluctantly, to relinquish the office.

Always active and alert, his soldierly appearance made him a conspicuous figure anywhere; as a matter of fact, he had during his lifetime, a connection with military matters, being one of the original members of the old Volunteer Force.

In addition to his interest in ornithology, he was a keen sportsman and a good shot, his love for shooting persisting to the very end, for he was out with the gun last year, and had looked forward to another appearance in the field during the coming season. He was also very fond of golf, being one of the original members of the Huddersfield Golf Club, acting as treasurer for many years, and he had also been the captain.

His activity was such, that after he had passed his seventieth year, he made an expedition to Iceland after birds, and only his great age prevented him, greatly to his regret, from joining the Universities' Natural Science expedition to Spitzbergen.

In business he was connected with the Huddersfield woollen trade, and in his experience, extending over seventy years, he had seen some remarkable changes, both in the trade and town of Huddersfield. His firm, with premises in the most important part of the town, was known as John Wilkinson (Huddersfield), Ltd.

The loss of his wife, in 1914, was a great blow to him, but despite this and his handicap of deafness, he was always a jovial and interesting companion, and it is sad to think that we shall see him no more among us. The Yorkshire Naturalists' Union have lost, during recent years, some very valued and loved members from the Huddersfield district, but none whose loss will be more deeply regretted than that of our old friend, Johnson Wilkinson.—R. F.

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REVIEWS AND BOOK NOTICES.

The Summary of Progress of the Geological Survey of Great Britain and the Museum of Practical Geology for the Year 1927. London: H.M. Stationery Office. Part I. (viii. + 32 pp., 1/6 net), contains many items of particular interest to our readers, among which we may enumerate District Reports from Yorkshire, by C. E. N. Bromehead; Lancashire, by W. B. Wright; Cumberland, by B. Smith; Northumberland and Durham, by R. G. Carruthers.

Travel and Sport in Many Lands, by **P. M. Stewart.** London: Thornton Butterworth, 320 pp., 21/- net. Major Stewart has provided us with another delightful book, and has given a wealth of illustration of little known lands, their people and fauna. He takes us to Rhodesia, Alaska, British Columbia, Tanganyika, Australia, New Zealand, Java, India, and ends by giving a chapter on Angling in England, with illustrations of well-known Yorkshire views. We cannot refrain from quoting a couple of stories from the book:—' Maoris are not always satisfactory converts. One, who was asked to testify at a Salvation Army meeting, electrified the congregation by the following words: " Last year I very bad man, I had nothing; this year I am Christian, and I have a little house, a pig, some potatoes, the wife, and a bloody fine football jersey.' A similar story is told of an Australian native. ' Who gave you your hat ? ' asked the missionary. ' God,' replied the convert, meekly. ' Who gave you your clothes ? ' ' God.' ' Who gave you your boots ? ' continued his spiritual instructor. ' God.' ' What did the devil give you ? ' was the next question. ' Nothing, blast him ' '

Burnby Hall from the Upper Water.

The Life-Force in the Plant World, by **Eleanor Hughes-Gibbs, F.L.S.** London: George Routledge, 1928, pp. 185, price 5/- net. This book is worth reading, if only for the excellent and sympathetic language in which it is written. To the author the wonderful devices in the plant world are evidence of a great Life-Force urging on to higher things, and the theme is developed in studies of spirality, rhythm, adaptability, reproduction, motility and response. In dealing with rhythm, the author says, 'Anyone who wants to observe the rhythm in a rose can do so with very little trouble. A rhythm, of course, is just an ordered recurring movement—the sort of thing that makes you a little sleepy to think of. It can become an awful and deadly monotony . . . . . But how, if the music is ascending with each rhythmic beat? How, if it is floating higher and higher, leading up to the unknown in spiral circlings like the song of the lark? Well, the rhythm of the rose does that, and if the rose-shoot did not stop, neither would the ascending music.' In similar terms she deals with secondary spirals in a fir cone and asks, 'Does this tell us nothing?' Does it not show that all Nature is singing around us, that there is indeed unity in the midst of diversity, and the one great Central Spiral holds all the secret of our being and of its good creation.'

The Origin of the Species, by **Charles Darwin.** Messrs. J. M. Dent & Sons are to be congratulated in issuing this volume as No. 811 of their Everyman's Library at the small price of 2/- (xxiv.+488 pp.). In addition to the book itself, there is an admirable introduction by Professor Sir Arthur Keith, a complete list of Darwin's published volumes, additions and corrections to the text in successive issues of the work, and a historical sketch.

The Geology of the Country around Woodbridge, Felixstowe and Orford, by **P. G. H. Boswell.** Geological Survey Memoir. London: H.M. Stationery Office, ix.+80 pp., 2/6 net. The particularly interesting area covered by this memoir describes the two recently issued colour-printed geological maps for Woodbridge and Felixstowe. It includes important sections in the London clay, chalk, crags, and glacial drift. It is also a favourite collecting ground for remains of Early Man, the account of whose relics in this memoir have been written with particular care and with due perspective.

South Lancashire, by **A. Wilmore.** London: Cambridge University Press, x.+160 pp., 3/- net. We were under the impression that this series of Cambridge County Handbooks had long since concluded, but another one has appeared on the market. Dr. Wilmore's general knowledge of geology and geography, particularly relating to this area, amply qualify him for the task, and he has carried it out well. Apart from photographs of typical sections, buildings, factories, and the country generally, he has provided a large number of diagrams illustrating various matters likely to interest students of local geography.

What Botany Really Means, by **James Small, D.Sc.** London: George Allen & Unwin. 1928, pp. 200, price 5/- net. This book is based largely on twelve half-hour talks broadcast to schools from the Belfast Station of the British Broadcasting Corporation, and the conversational form of the talks has been retained in an endeavour to keep the element of plain speech, together with a little scientific imagination. It is an attempt to make plain something of what we know about plants and plant life with the use of three technical terms, enzymes, osmosis, and gametes. The author begins with 'Our effervescent world,' and says, 'This is truly a funny world; I hope to tell you more and more how like it is to a bottle of lemonade. You have all, at least once, taken the stopper out of that sparkling mineral water and seen bubbles of gas and water fizz up, effervesce. That gas is called carbon dioxide, so now you know what I mean by carbon dioxide and water.' 'Life,' he says, 'is mainly a putting together of carbon dioxide and water, and then separating them again. One needs energy, force, to get them together, and that energy is freed when you, so to speak, take the cork out of the bottle . . . . energy used up in bottling the gas and the water; energy freed when the gas and water mixture is allowed to separate into its two elements. That is the idea I want you to follow in this series of talks, the idea of an effervescent world.' Further chapters deal in similar language with the life engine, life and the green leaf, food-chains, running sap (which has inspired the author to produce a rather weird frontispiece), plant sociology, co-operation, the next generation, the pattern of the bottle, evolution in general and of higher plants, and the science of life.

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PROCEEDINGS OF SCIENTIFIC SOCIETIES.

An interesting cup-and-ring stone is illustrated and described in No. 18 of *The Proceedings of the Society of Antiquaries of Newcastle-upon-Tyne.*

R. G. Collingwood favours us with a reprint of his report on 'Excavations at Brough-by-Bainbridge,' reprinted from *The Proceedings of the Leeds Philosophical Society*, Part 4 of Vol. I.

In *The Proceedings of the Society of Antiquaries of Newcastle-upon-Tyne*, No. 19, appears an illustration of an Ancient British Burial. This shows a rectangular hole covered by a large slab of stone.

The Transactions of the Thoroton Society contain illustrations of Neolithic and Bronze Age axes, and some fine photographs of pottery from Claudian Well and other areas. Some of these seem to have had 'some' restoration.

Prof. P. G. H. Boswell has a valuable paper in *The Transactions of the Geological Society of Glasgow*, recently issued, on 'The Rarer Detrital Minerals of British Sedimentary Rocks,' which will especially appeal to our readers.

The Transactions of the Cardiff Naturalists' Society, Vol. LIX., just to hand, contains notes on 'Welsh Vineyards,' by A. A. Petigrew; 'The Non-Marine Mollusca of Glamorgan,' by J. D. Dean; 'The Beaupré Porch,' by C. Fox, and the reports of the various sections.

Part XXIX. of *The Transactions of the Yorkshire Dialect Society* contain 'A Yorkshire Dialect Survey,' by J. Fairfax-Blakeborough; 'Yorkshiremen and Scotsmen,' by W. Grant; 'Yorkshire Dialects,' by H. J. C. Bruff; and 'Depper Awd Mare,' by F. A. Hyde.

Though the title is more definite in its scope than the paper, our readers will find much of interest in Dr. R. L. Sherlock's paper entitled 'A Correlation of the British Permo-Triassic Rocks: England South of the Pennines and Wales,' appearing in *The Proceedings of the Geologists' Association*, Vol. XXXIX., Part 1.

The Felsted School Scientific Society continues to print its valuable Report; No. 30, covering two years, having recently been received. There are some useful zoological records illustrated by photographs; botanical and geological notes, and reports on 'wireless,' astronomy, and meteorology. We are glad that this old society, founded over fifty years ago, still continues its good work.

The Report of the Marlborough College Natural History Society keeps up its standard, and No. 76 (92 pp., 5/-) has several plates from interesting photographs. There are detailed reports of the Astronomical, Natural Science, Ornithological, Botanical, and Entomological Sections, Meteorological Observations, as well as other notes, and an illustrated account of *Attheyella wulmeri* Kerherve, one of the Harpacticids.

Mr. Henry Preston contributes an article dealing with some Anglo-Saxon cinerary urns recently found in the Grantham neighbourhood, to the *Sixth Annual Report of the Grantham Public Library and Museum.* Judging from the illustrations, some of these very much resemble examples found in the Saxon cemetery at Sancton, East Yorkshire, now in the Hull Museum. One or two, however, are of quite unusual design.

1928 Aug. 1

Sir John S. Flett favours us with a copy of his 'Report of the Geological Survey Board for 1927,' reprinted from the *Summary of Progress for* 1927.

The Caradoc and Severn Valley Field Club has just issued two publications; one, No. 37, being entitled *Record of Bare Facts for the Year* 1927 : A List of the More Noteworthy Observations made by Members of the Caradoc and Severn Valley Field Club and others. The other is No. 1 of Vol. VIII. of *The Transactions of the Caradoc and Severn Valley Field Club*, and includes 'Some Interesting Farm Plants,' by D. H. Robinson ; 'The Survey of Soils,' by W. Morley Davies ; and 'Shropshire Surnames,' by Miss H. M. Auden.

The Lincolnshire Naturalists' Union's Transactions, for 1927, contains Mr. H. Wallis Kew's admirable Presidential Address on 'Martin Lister and Lincolnshire Natural History,' and deals with seventeenth century records. D. Roebuck gives 'Studies in the Genus Phaedon,' and there are the usual useful sectional officers' reports. Mr. H. Preston records a 'fine species of *Ammonites bucklandi*, 15½ inches across,' which he believes is 'the largest species of Ammonite occurring in the Liassic Clays.' We don't think it is !

In addition to Captain Fullarton James' Presidential Address in Volume XXVI., Part II., of the *History of the Berwickshire Naturalists' Club*, there are many important papers likely to interest our readers. G. Bolam writes on 'The Lepidoptera of Northumberland and the Eastern Borders' ; J. Clark, on 'Sawflies of Berwickshire' ; J. B. Duncan, on the 'Mosses and Hepatics of Berwickshire and Northumberland' ; there are historical and meteorological notes, and reports of the delegates on visits to the British Association at Oxford and Leeds.

Volume VII., Part 4, of *The Proceedings of the University of Durham Philosophical Society* (5/-) contains a large number of valuable memoirs. Those of particular interest to our members are 'The Inheritance of Food Habits in the Hybrids between the Geometrid Moths *Pœcilopsis pomonaria* Hb. and *P. isanellæ* Harrison,' by J. W. H. Harrison ; 'The Use of the Bleaching Action of Chlorine in the Rapid Detection of Fatty Oils and the Investigation of some other Substances and Structures of Green Cells,' by Miss K. B. Blackburn and M. Thomas ; 'A Petrological Investigation of the Coal-Measures Sediments of Durham,' by J. G. Kellett ; 'The Weathering of Cheviot Granite under the Peat,' by S. J. Tomkeieff ; and 'A Preliminary Account of the Dykes of Northumberland,' by G. S. Mockler.

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NEWS FROM THE MAGAZINES.

Arthur Sharp writes on 'Birds of the Moorland' in *The Animal World* for May.

P. G. Ralfe continues his Manx Ornithological Notes, in *British Birds* for June.

An obituary notice of Dr. H. F. Gadow, F.R.S., by 'J.S.G.' appears in *Nature* for June 2nd.

Dr. Marie V. Lebour has an illustrated article on Dinoflagellates in *Science Progress* for July.

W. J. Kaye describes 'A Viking Grave near Harrogate,' in *The Durham University Journal* for June.

P.G. writes on 'The Lemon,' and T. G. Evans on 'The Saint's Bag,' in *The Medical Herbalist*, Vol. III., No. 9.

Four Black Terns are recorded in the Mexborough district on May 5th, in *The North Western Naturalist* for June.

The Journal of the Ministry of Agriculture for June contains a paper on 'Weeds of Arable Land,' by H. C. Long.

Dr. James Ritchie, the editor, has a note on 'The Young Idea and its Training,' in *The Scottish Naturalist*, No. 170.

The Summer Number of *Bird Notes and News* contains an article on 'Collectors and Collecting,' by T. A. Coward.

H. C. Long continues his description of Weeds of Arable Land, in *The Journal of the Ministry of Agriculture* for July. The illustrations are very well done.

The Philadelphia *Museums Journal* for March contains a wonderful series of illustrations of gold ornaments from the Royal Tombs of Ur of the Chaldees.

An account of an 'Extraordinary General Meeting' of the R.S.P.C.A., which was 'extraordinary' in more ways than one, appears in *The Animal World* for June.

J. G. Kellett writes on 'The Physical Constitution of Bituminous Coal and Coal Seams,' referring to Northumberland, in *The Colliery Guardian* for July 20th.

A 'Witch Stone' from Huby is figured in *The Yorkshire Archæological Journal*, Part 114. In the same publication a Viking Axe-head is recorded as found near Harrogate in 1901.

The *Natural History Magazine*, issued by the British Museum, South Kensington (Vol. I., No. 6, price 1/-), has an illustrated article on 'Landslips in Dorset,' by Dr. W. D. Lang.

The Nierenstein Reaction ; Infra-Red Emission of Carbon Dioxide ; The Spectrum of Ionised Sodium ; and Uncommon Common Salt are some of the subjects dealt with in *Nature*, No. 3059.

The Geological Magazine for June contains papers on 'A Rare Euryocrinus from the Carboniferous Limestone from Coplow Knoll, Clitheroe, by James Wright ; and 'The Magmatic Origin of Ores,' by R. H. Rastall.

The Journal of Conchology for May contains notes on '*Vertigo alpestris* var. *albina* in Westmorland,' 'The First-known Occurrence of *Limax tenellus* in Britain,' and 'Cephalopoda landed at Scarborough in 1927.'

K. G. Blair, in *The Entomologist's Monthly Magazine* for July, makes a number of additions to a recent list of his relating to the Coleoptera of the Isle of Man, as a result of reading a paper in *The Naturalist* for 1911.

The Ibis for April contains the Sixth Report of the Committee on the Nomenclature and Records of Occurrences of Rare Birds in the British Islands, and certain necessary Changes in the Nomenclature of the B.O.U. List of British Birds.

Referring to 'The Tragedy of Briton's Rarest Moths,' Mr. H. Stringer (in *The Natural History Magazine* for July) refers to Cribb's capture of *Schiffermulleiia woodiella* on Kersal Moor, Manchester, which 'has never been met with again in any part of the world.'

The Vasculum for May has notes on 'The Variability and Instability of the Colouration in the Flowers of the Primrose and of the Cowslip,' by the late Miller Christy ; 'Holy Island' ; and 'Abnormal Roots of *Caltha palustris* (Marsh Marigold),' by M. I. Ritson.

The Natural History Magazine for July contains J. Kirkpatrick's record of his 'Five Days on Kilimanjaro' ; J. G. Dollman's record of the 'Bongo from the Belgian Congo' ; H. A. Baylis' record of 'Heavy Parasitic Infection in Whales' ; G. J. Arrow writes on 'Some More Memetic Beetles' ; W. N. Edwards refers to 'Extinct Flowering Plants and their Mining Allies' ; and Dr. L. J. Spencer to larger specimens of Spar from Shropshire, among many other valuable notes.

In *Nature* for July 14th, under ' University College, Hull,' Laboratory Stewards for the departments of Chemistry and Physics respectively are required, previous experience necessary, and ability to carry out minor repairs to apparatus desirable. Standing wage, £2 10s. per week.'

The China Journal for May is largely devoted to the silk industry, and among the many illustrations we observe one showing ' Methods adopted by Messrs. Brunner, Mond & Co., to persuade the Chinese Farmer to use Artificial Fertilizers for Mulberry Trees and thereby help to eradicate Hookworm Disease.'

An obituary notice of the late C. G. Danford, appearing in *The Ibis* for July, reveals this versatile naturalist in an ornithological role of which we had no idea. The British Museum collections owe much to his work, and the Lesser Spotted Woodpecker of the Taurus Mountains, *Picus danfordi*, was named after him.

London Reservoirs and Bird Life ' ; ' Kent and Surrey Brambles' ; ' The Woodlark and its Nest ' ; ' Cuckoo taking Eggs ' ; ' Migration of Gulls ' ; ' British Elms ' ; ' London Birds ' ; ' The Elephant Hawk Moth,' are some of the many papers in *The London Naturalist* for 1927 (40 Winchester House, Old Broad Street, E.C. 2, 54 pp., 3/-).

O. T. Jones and P. G. H. Boswell, writing in *Nature*, No. 3057, on the ' Geological Features of the Sites of the Sligo Implements,' found by J. P. T. Burchell, and described as human by J. R. Moir, state ' We are absolutely convinced that there is no case whatever for supposing that the sites concerned are of any antiquity, with the exception of Ballyconnell, the ' implements ' from which, . . . are not enthusiastically accepted.'

The contents of *The New Phytologist* for May include ' The Tree Habit in Angiosperms : Its Origin and Meaning,' by Agnes Arber ; ' Disease Resistance in Plants,' by F. T. Brooks ; ' On Desmid Plankton,' by B. M. Griffiths ; ' Distribution of Carbon/Nitrogen in the Various Organs of the Wheat Plant at Different Periods of its Life History,' by Phyllis A. Hicks ; and ' On an Abnormality in *Digitalis purpurea*,' by Violet L. Anderson.

Among the contents of *The Murrelet*, published by the Washington State Museum for the Pacific North-west Bird and Mammal Society, edited by F. S. Hall, Vol. IX., No. 1, we notice ' The Bowron Lake Moose, their History and Status,' by T. T. McCabe and Elinor B. McCabe ; ' Small Mammals of the Yakima Valley, Washington,' by L. K. Couch ; ' Vermin ' ; ' Birds observed at Westport, Washington,' by D. E. Brown, together with many short notes.

The Journal of the Imperial Fisheries Institute of Japan, Vol. XXIII., No. 5, contains the following valuable papers, all printed in English : ' A new Method of Measuring the Degree of Vacuum in Packed Can,' by Kazumi Isii ; ' On the Influence of the Water Temperature upon the Hatching of Eggs of *Hypomessus olidas* Pallus,' by Nobutaka Nakai ; ' On the Relation between the Temperature and the Vitality of the Oyster Preserved in the Air,' by Juzo Hori ; ' The Strength of Netting Cords against the Repeated Blow,' by Morisaburo Tauti.

We are glad to receive an interesting number of *The Rochester Naturalist* (pages 77-117, 1/-, obtainable from R. F. Jessup, Editor, Elmhurst, Cross Lane East, Gravesend). Besides a foreword by Sir Martin Conway, J. H. Evans writes on ' The Megalithic Monuments of the Medway Valley ' ; and G. E. Frisby on ' The Hymenoptera of the Rochester District.' In addition there are notes on ' The Sense of Smell in *Vanessa atalanta*,' by G. E. Dibley ; ' The Hobby Falcon,' by F. D. Welch ; ' A Romano-British Cist at Northumberland Bottom,' by R. F. Jessup ; ' Archæological Discoveries in the Area,' by N. C. Cook ; and reports of the various natural history sections.

In *The Scottish Naturalist*, No. 171, Mr. Herbert Maxwell points out that : ' It is not wise to bite off more than one can chew. On the 17th April, two Pike, weighing 7 lb. apiece, were washed ashore in the White Loch of Myrtoun, Wigtownshire, both firmly locked together head to head. One had endeavoured to swallow the other, but by some misjudgment had tackled a fellow of its own size, so that, having engulfed the head, it discovered that it could neither continue the process of swallowing nor let go. Held fast in this strange embrace, both Pike starved to death.'

The Journal of the South-eastern Agricultural College, Wye, Kent, No. 24 (196 pp., 7/6 post free) contains, among many other interesting items, ' Work and Progress of the College Poultry Department,' by F. W. Rhodes ; ' The Dairy Bacteriological Advisory Service,' by H. Barkworth ; ' Hops,' by E. S. Salmon and A. H. Burgess ; ' An Attack of Cockchafer Larvæ on Grassland and some experiments in connection with their Control,' and ' Caterpillars and Plant Lice attacking Chrysanthemums under Glass,' both by F. V. Theobald ; ' The Scarcity of Aphides in 1924 in Southern Britain ' ; ' A New Gall Midge attacking *Arabis albida*,' by H. F. Barnes and F. V. Theobald ; ' The Beet Eelworm : Its History when found on Hops in this Country,' by C. A. W. Duffield : and ' The Blossom Beetle attacking the Seed Crop of Swedes,' by C. A. W. Duffield.

The editor of *The Irish Naturalist's Journal* for July appears to look upon the alleged prehistoric discoveries at Rosses Point, by J. P. T. Burchell and J. R. Moir, as a ' Glozel ' discovery. He states, ' Another letter on the subject has appeared in *Nature* (23-6-28), this time from Mr. Burchell's own pen. It contains a criticism of the report by Professors Jones and Boswell, and, so far as we understand it, Mr. Burchell is pleased that only twenty-six out of the thirty-six slabs encumbering the floor of the ' rock-shelter ' are thrown up or pushed up by the waves. What will his friend Mr. Reid Moir say to this, and why is this fact only admitted now ? Mr. Burchell's most recent discovery and announcement is of shattering importance,—the concrete platform which overhangs the cave on Coney Island is not the base of a beacon but a platform ' made flat for the use of the men who pump sea-water for the containers of the beacons situated further inland.' Moreover the cave was there when the platform was built ; Mr. Burchell has ascertained this *from the man who built it*. How this will prove that the cave is Mousterian we do not quite understand. Another ' red herring ' is the statement that ' There have been occasional falls of cliff along the Carboniferous Limestone coast-line of Gower, Wales. But Paviland Cave is Palæolithic.' Yes ! Paviland *is* Palæolithic, but merely because deposits of Palæolithic age, including a *human skull*, have been found in it ; not because Mr. Burchell says so.'

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NORTHERN NEWS.

The Newbury Museum is to be enlarged on the ' Space for Time ' method, and funds are required for the purpose.

Dr. C. B. Fawcett has been appointed to the University Chair of Economic Geography at the University College, London.

In response to a review recently appearing in these columns, a Hull firm has been asked to supply a copy of ' The Origin of Speeches ' !

A further section of Sherborn's *Index Animalium* has been published, which brings the total number of the second part of this wonderful work to page 3970.

Dr. T. W. Woodhead is retiring from the Technical College, and communications should now be addressed to him at the Tolson Memorial Museum, Huddersfield.

Those in the habit of preserving the Programmes of the Yorkshire Naturalists' Union should alter the number at the top of the Sledmere Circular, enclosed with *The Naturalist* for July, from 342 to 344.

At a recent meeting of the Royal Society of London, C. A. Seyler read a paper on 'The Dictyoxylon cortex of Lycopodiales as a constituent of coal,' based upon researches in the Grassmoor Colliery, Derbyshire.

Among the recent additions to the specimens at the British Museum (Natural History), South Kensington, is "an attractive group of snow-white coralloidal aragonite ("flos ferri") from Arkengarthdale, Yorkshire."

For the small sum of threepence, the National Museum of Wales has issued a Short Guide to the Museum and its Contents. It is well illustrated by mounted reproductions of photographs. There is a plan, and 76 pages of letterpress.

An excellent Catalogue of the Permanent Collection of Paintings and Drawings in the Leeds City Art Gallery has been issued by the Director, Mr. F. Lambert (vi.+78 pp., 1/-), and contains some exceptionally good illustrations of the principal pictures.

We have been favoured with a remarkably well illustrated paper on 'British Post-Pliocene Unionidæ: the Hybrids between *Unio pictorum* Linn. and *U. timidus* Retz. from Repton Park, Derbyshire,' by A. S. Kennard, A. E. Salisbury and B. B. Woodward, with Appendix by H. H. Bloomer.

Part IV. of *The Natural History of Wicken Fen* (Cambridge: Bowers & Bowers, 6/- net) contains a further series of memoirs dealing with this interesting area, and different experts write on Coleoptera, Fossil Vertebrates, Collembola, Diplopoda and Chilopoda, Cladocera, Microbiology, Hemiptera, Heteroptera, etc., of that district.

A third edition of the British Museum (Natural History) valuable pamphlet, entitled 'The House-fly: Its Life-history, importance as a disease carrier, and practical measures for its suppression,' by Major E. E. Austen, has been called for, and contains 72 pages, various illustrations, and is sold at the low price of one shilling.

From *The Hull Daily Mail* we learn that the Chairman of one of the committees at Hull thinks that it is *deplorable* the old Art Gallery should be used for the purpose of a museum to take the Mortimer Collection of Prehistoric Antiquities. He considers the two rooms at present allocated to Roman and Saxon antiquities would have made excellent lavatories and cloakrooms, and that the two larger rooms would have been suitable for whist-drives and dances.

At a recent meeting of the Mineralogical Society, Mr. S. I. Tomkeieff gave a contribution to the Petrology of the Whin Sill. Certain rare varieties of the Whin Sill are described, such as the coarse gabbroidal rock, occurring in the form of bands within the mass of the normal dolerite, the coarse rock with red granophyric spots, the red felsite veinlets, and spherical aplitic inclusions. A scheme of differentiation is applied to explain the origin of these varieties.

Mr. George Bolam, whose interesting 'Notes on the Natural History of Hornsea Mere' appeared in our journal in 1913, has favoured us with a report of part of 'The Lepidoptera of Northumberland and the Eastern Borders,' from the History of the Berwickshire Naturalists' Club. The part sent deals critically and in detail with the known distribution of the Noctuæ and Geometers in the area covered. Most of the species known to earlier observers still occur. Mr. Bolam's references to the oviposition and other habits of many of the forms add considerably to the value and interest of his list, which should be of much service to Northumbrian lepidopterists.

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PRINCIPALLY FOR THE NORTH OF ENGLAND.

NATIONAL MUSEUM
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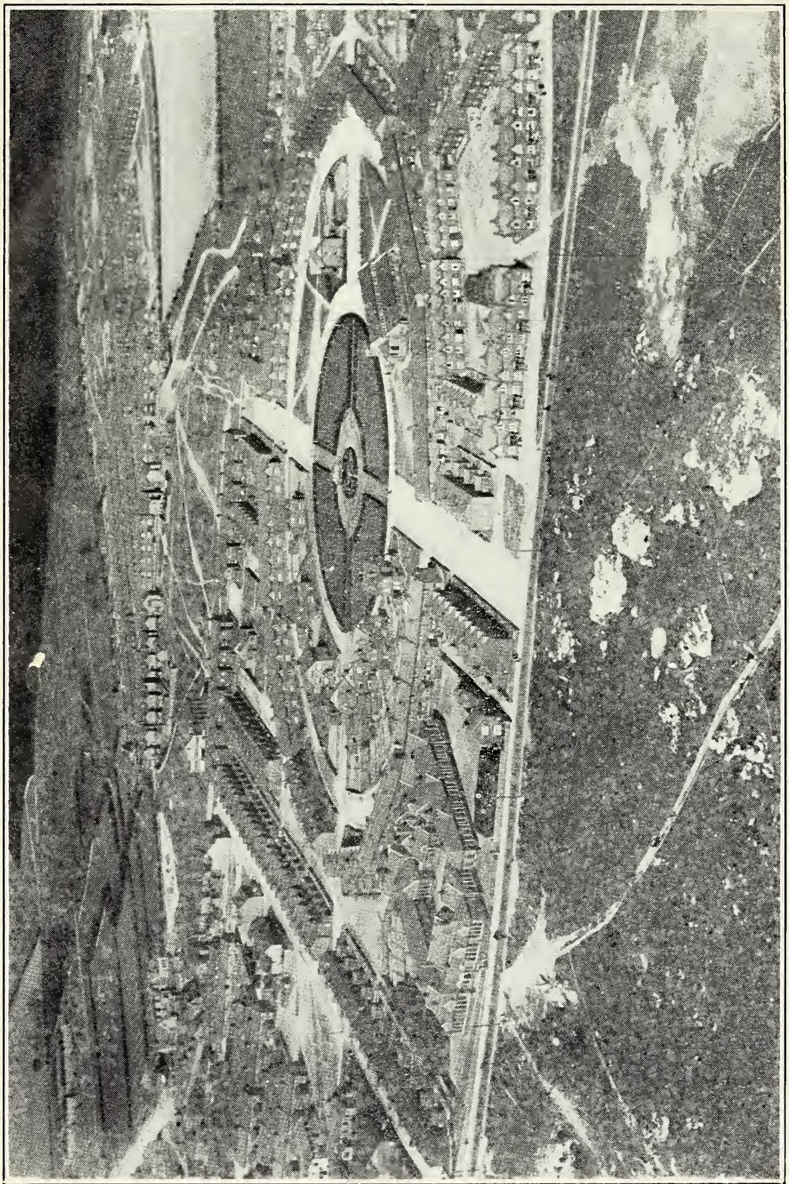

Maltby Colliery Village, South Yorkshire.

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NOTES AND COMMENTS.

A MODEL COLLIERY VILLAGE.

The Colliery Guardian from time to time has published views of different collieries, taken from the air, and recently several of Yorkshire Collieries have appeared. These are interesting as illustrating the difference between old-time methods of arranging the collieries and houses for the miners, and those of the present day. As showing the possibilities when a definite planning scheme is arranged, the view of the Maltby Colliery village in the issue for June 15th is a fine example. We are kindly permitted to reproduce this block. (Plate VI.).

GEOLOGY AND ARCHÆOLOGY.

At a recent meeting of the Yorkshire Geological Society, Mr. C. E. N. Bromehead gave a few notes on archæological objects at York of interest to geologists, and discussed the use of Magnesian Limestone and Millstone Grit in Roman, Saxon and Norman times. A carved slab in York Minster was specially mentioned, as archæologists differed as to its date. This stone has been identified by the Survey as Magnesian Limestone. All the churches in the district built in pre-Conquest times were of grit ; Norman additions of limestone, even when limestone had to be carried a long distance and grit was available on the spot ; the same applied to carvings. The geological evidence was therefore strongly in favour of the twelfth century date of the carving, and against the pre-Conquest date urged by one prominent archæologist.

ALGÆ OF A YORKSHIRE BOG.

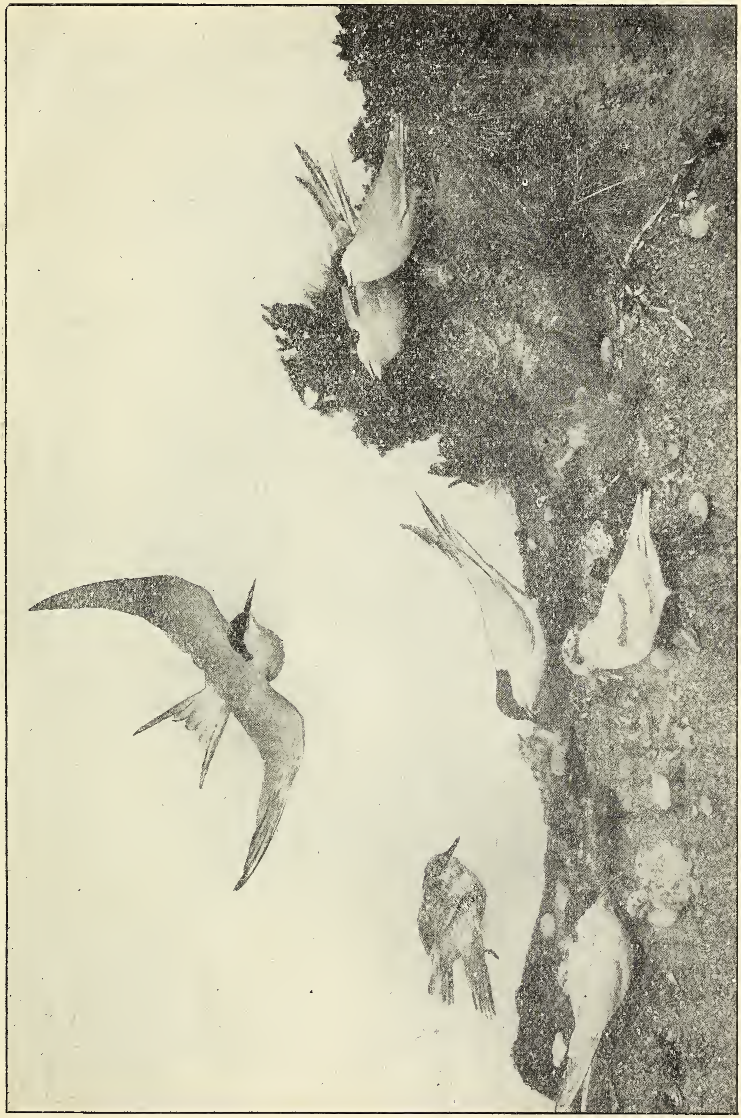
At a recent meeting of the Linnean Society of London, Mr. A. M. Smith gave an account of his investigations of the algæ of a bog, continued over a period of five years. Observations were taken at approximately monthly intervals of the algæ of a small *Sphagnum* bog near Bradford from March, 1923, to August, 1927. Observations of the temperature and of the *p*H values of the water were also made. Two main algæ associations were clearly distinguished : (1) the association of the *Sphagnum* pools, and (2) the association of the mud pools and deeper ditches. The association of the *Sphagnum* pools had *Zygogonium ericetorum* and *Microspora floccosa* as co-dominants, and *Cylindrocystis brebissonii, Tetmemorus lævis, Staurastrum punctulatum Œdogonium rufescens, Sphærocystis schroeteri, Merismopedia glauca, Oscillatoria tenuis,* and *Navicula* spp. as the characteristic subordinate species. The association of the mud pools and deeper ditches had *Mougeotia* sp., *Mougeotia viridis, Microspora tumidula* and *Microspora stagnorum* as its dominants, and *Mougeotia parvula, Closterium striolatum, C. rostratum, Hormidium subtile* and *Tabellaria floccosa* as its chief subordinate species. After the drainage of the bog in 1923 the *Sphagnum* association decreased, and the long, slow choking of the bog channels which followed later was accompanied by the gradual extension of this characteristic association. The total quantity of alga in the bog varied with the quantity of water in the bog, and showed little evidence of any check due to low temperatures. The quantity of certain species, however, *e.g.*, a sterile species of *Mougeotia*, showed signs of diminution due to low winter temperatures. *Mougeotia viridis, Cylindrocystis brebissonii* and *Œdogonium rufescens* were frequently found in conjugation. *Mougeotia parvula* and *Closterium parvulum* conjugated rarely. The other species remained sterile.

ALGÆ ON THE CONTINENT.

Professor F. E. Fritsch referred to the work on the algæ of *Sphagnum* pools that had been done on the continent. It had been shown that, when the pool was completely separated by peat from the underlying rock, a very restricted Desmid-flora, and one of remarkable constancy, was to be found. Mr. Smith's list of *Sphagnum* algæ included only one of these Desmids, and it would be interesting to know whether he had obtained any data as to the depth of peat underlying his pools. Two of his commonest forms, viz., *Zygogonium ericetorum* and *Cylindrocystis brebissonii,* were common soil-algæ, and their abundance might be due to their occurrence on the surrounding surface. The violet granules in the sterile species of *Mougeotia* might be of the nature of Lagerheim's phycoporphyrin. The close correspondence between volume of water and quantity of alga was striking, as this was by no means always the rule ; in fact, in lowland pools algal growth was often at its lowest when the pool was fullest. *Chrysopyxis bipes* was a new record for Great Britain.

BRIGHTON BIRDS.

While most museums in this country seem to claim they have one of the best, if not the best, collection of British birds, we think that from the point of view of the ordinary visitor, this claim goes to the Booth Museum, Brighton. There are something like 500 cases of birds, and in most instances the specimens have been collected with due regard to variations in plumage, male and female, nests, young, etc. In nearly every instance each species has a case to itself in which the specimens are shown in their natural surroundings. The Brighton Corporation has recently issued the fifth edition of the ' Catalogue of Cases of Birds in the Dyke Road Museum, Brighton,' a substantial volume of 300 pages with numerous plates. It is sold for the very low price of half-a-crown, which must be considerably less than the actual cost. We are permitted to reproduce one of the illustrations herewith,

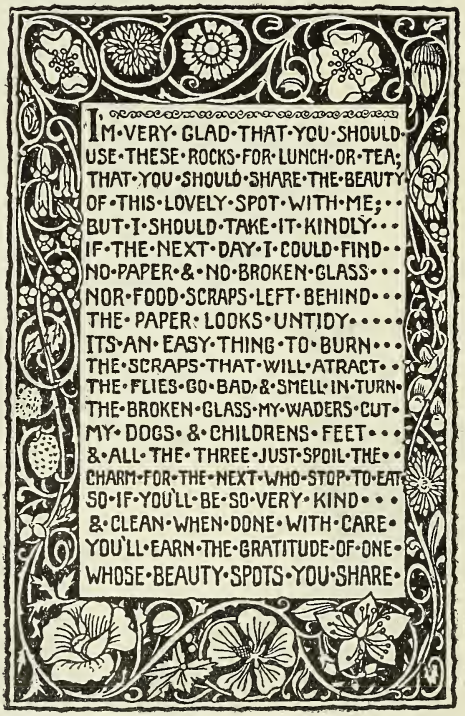


Common Tern.

which may be taken as typical of the remainder. As showing the thoroughness of the way in which Mr. Booth endeavoured to give the birds their natural surroundings, a whole stuffed sheep, with a hurdle, etc., occurs in one case to illustrate the usual conditions under which the Rose-coloured Pastors are to be found.

BEAUTY SPOTS AND LITTER.

The Editor of *Better Health* has lent us the interesting block reproduced herewith, which speaks for itself. We understand it originally appeared in some journal published in the Liverpool area dealing with 'Camping,' and if any of our readers can let us have its source we shall be obliged. Presumably the illustration is of a larger poster which might be placed in suitable positions.



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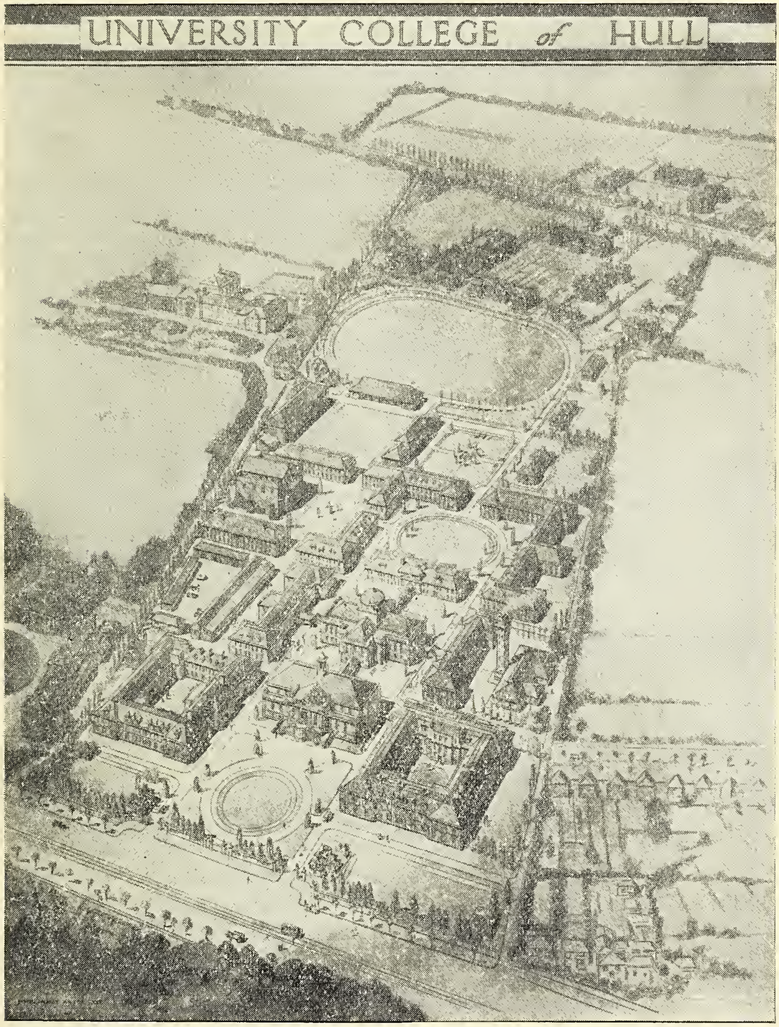
YOU'LL·EARN·THE·GRATITUDE·OF·ONE·
WHOSE·BEAUTY·SPOTS·YOU·SHARE·

A BLOCK OF COAL.

What is said to be the largest single block of coal yet mined from an English colliery is illustrated in *The Colliery Guardian* for July 6th. The block weighs four tons. It was the full seam of the Doncaster Barnsley Bed, and was mined by the Brodsworth Main Colliery Co., Doncaster.

HULL UNIVERSITY COLLEGE.

The Hull University College issues pamphlets from time to time. A little while ago an interesting illustrated account appeared of the visit of the Duke and Duchess of York on the occasion of the laying of the Foundation Stone of the buildings.



Just recently another, with illustrations of the Halls of Residence, has been issued, together with an account of The Corporate Life in the University College of Hull. From this we learn that ' Fifty years hence, if plans at present conceived come to maturity, the University College of Hull will probably have ample provision for residence within the campus on which the complete building scheme is laid out. The plan includes space for seven Halls of Residence to accommodate eventually some 600 students.' The plan reproduced herewith by kind permission—a bird's-eye view of the College as it is hoped that it will eventually appear—shows the situation of the Halls of Residence, and their immediate accessibility from every department of the College and from the playing fields and tennis courts.

THE STAFF.

The College staff already appointed consists of :—Principal, A. E. Morgan, M.A. (Dublin). *Classics*—Lecturer : M. M. Gillies, M.A. (Cantab.), Ph.D. (Edin.). *Philosophy and Psychology*—Professor : T. E. Jessop, M.A. (Leeds), B. Litt. (Oxford). *History*—Professor : C. Gill, M.A. (Cantab.), Litt.D. (Leeds). *Romance Languages*—Professor : F. C. Roe, M.A., L. és L., D. és D. *Germanic Languages*—Lecturer : O. H. Edwards, M.A. (Belfast), Ph.D. (Bonn). *Law*—Lecturer : J. L. Montrose, LL.B. (London), of Gray's Inn, Barrister-at-Law. *Conveyancing*—Lecturer : W. A. Austin. *Trust Accounts and Book-keeping*—Lecturer : F. S. Mowforth, A.C.A. *Geography*—Lecturer : H. King, B.A. (Liverpool). *Mathematics*—Lecturer : G. C. Steward, M.A. (Cantab.), D.Sc. (London). *Zoology*—Professor : A. C. Hardy, M.A. (Oxon.). *Botany*—Lecturer : R. D. O. Good, M.A. (Cantab.). *Chemistry*—Professor : F. G. Tryhorn, D.Sc. (Liverpool). *Physics*—Professor : L. S. Palmer, M.Sc., Ph.D. (Bristol). *Adult Education*—Head of Department : Professor T. H. Searls, M.A. (Cantab.) ; Staff Tutors—Middlesbrough, L. G. Johnson ; Grimsby, G. E. T. Mayfield. The Professors of English Language and Literature, and of Economics and Commerce, are yet to be appointed.

BOTANICAL EXCHANGE CLUB.

We have received the *Report of the Botanical Society and Exchange Club* for 1927.* From this we learn that 'As might have been expected after such an unfavourable collecting season as the summer of 1927 proved to be, the number of plants contributed to the Exchange was below the average : 28 members sent in 4485 sheets. The greater part of these came as a result either of critical study by members of the variations of well-known British plants, or of the equally interesting problems of the occurrence of plants of alien origin. A series of beautifully prepared American plants came from Professor Beattie and a very welcome Canadian gathering of *Ludwigia palustris* from Fr. Arsène, our largest contributor.'

---

* Pp. 559-593. T. Buncle & Co., Arbroath, 4/-.

Barden Moor.

MUSEUMS' ASSOCIATION CONFERENCE.

PLATE VII.

THE thirty-ninth Annual Conference of the Museums Association was held at Glasgow from July 2nd to 6th. A competent committee had been appointed to carry out the arrangements, and the delegates were indebted to the Lord Provost and the Local Committee for the facilities given, and for the hospitality which was tendered on every occasion.

The headquarters of the Association were at the Central Hotel, which proved to be admirable for the purpose. The meetings were held in the M'Lellan Galleries, and the badge given to the delegates represented a Scottish targe or shield, with broad sword, of the middle of the eighteenth century, designed from originals in the Kelvingrove Museum. Vice-President T. C. F. Brotchie, Director of the Glasgow Art Galleries, and Mr. John Fleming, the Local Secretary, were largely responsible for making the arrangements. The Convenor of the local meetings was Councillor J. Drummond, whose personal attention was given during the whole of the meeting.

Probably the most striking feature of the Conference was the wealth of museums, art galleries, parks and other open spaces which occur in Glasgow. So long ago as 1670, the Glasgow Town Council began collecting Royal and other portraits, which were transferred to the Town Hall, built in 1737, and remained there until the 'fifties, when the Corporation purchased the M'Lellan Galleries with its art treasures, all of which were subsequently transferred to the Kelvingrove Galleries, erected at a cost of £256,000. These were opened to the public in 1902.

There is a People's Palace Branch Museum in Glasgow Green, which contains special loan exhibitions and collections of objects of art. The Camphill Branch Museum, opened in 1896, also contains art objects, natural history collections, and special exhibitions. The Tollcross Branch Museum, in Tollcross Park, was opened as a Children's Museum in 1905. Here are natural history objects, a few relating to technology and art ; an aquarium, and an aviary. Mosesfield Branch Museum was opened in 1905, but is chiefly a place of rest and recreation. It contains four cases of specimens, and pictures and prints on the walls.

In addition there are the museums in connection with the universities, the visitors to the zoological museum there being particularly interested in the unusual and effective methods of lighting and casing shown.

A day was spent at Paisley, where the Paisley Museum and Art Galleries were examined. There were many features of special importance, including an exhibition of early Paisley shawls, etc. Many interesting visits were paid to different places, Loch Lomond Park, Fossil Grove, etc. The delegates had a hearty welcome wherever they went, and were entertained to tea, and a Civic Reception was held in the Kelvingrove Galleries.

With regard to the Conference itself, Sir Francis Grant Ogilvie commenced the proceedings with his Presidential Address. This dealt with The Carnegie United Kingdom Trust; The Report of Sir Henry Miers; The Royal Commission on National Museums and Galleries; Museums To-day; Locality and Region; Science and Industries; Preparation of special types of 'objects'; Consultation outside; Space, staff, funds; Temporary Collections and temporary Grouping; The General Collections; Museums, Art Galleries, Libraries and Music.* Sir Francis's address is printed in *extenso* in *The Museums Journal* for August, and detailed reports of the papers read and proceedings of the Conference generally, are appearing in that journal for September.

With regard to the Kelvingrove Galleries, a particularly pleasing feature was the tremendous extent to which publications of various descriptions were sold. These vary from large and beautifully coloured and framed reproductions of some of the pictures, down to cheap postcards, and from elaborately coloured monocrome views of art subjects, down to cheap pamphlets. The amount of income from these sources was remarkable, and more than paid the cost of the staff engaged in connection therewith. The Superintendent, Mr. Brotchie, has published a volume entitled 'Hours in the Glasgow Art Galleries,' a copy of which was given to each of the delegates. Another artistic publication was the Souvenir of the Glasgow Art Exhibitions, one of the illustrations from which we are kindly permitted to reproduce. (Plate VII.).—T.S.

——:o:——

The Proceedings of the St. Peter's School Scientific Society, No. 9, recently to hand, contain an excellent account of an excursion to Rievaulx Abbey, with notes on the botany, geology, geography, etc. There are also notes on the Flora of York and District; and on the Occurrence of *Gladiolus communis* at Strensall Common; Fungi; Meteorological Notes, and visits to works. The President of the Society is Mr. S. M. Toyne, and the Hon. Secretary and Editor, Mr. G. P. Easten.

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* The writer of these Notes had the privilege of proposing a vote of thanks to the President for his Address, and for his conduct in the chair during the year. He reminded Sir Francis that at the first Museums Conference he was privileged to attend, at Edinburgh, nearly thirty years ago, Sir Francis then had charge of that Museum, and took a keen interest in the Conference. In those days he was assisted in entertaining the delegates by Sir William Turner, Dr. Traquair, Dr. Littlejohn, Mr. J. G. Goodchild, and Mr. Aymer Vallance, none of whom is now with us.

SCIENTIFIC SOCIETIES AND INCOME TAX.

Apparently the payment of income tax by certain scientific societies has been demanded, whereas in other instances no application has been made. The matter was taken up by the British Association for the Advancement of Science, and after considerable negotiations, two test cases were agreed upon, and the Geologists' Association of London, and the Midland Counties Institution of Engineers, were selected as typical societies. As these institutions exist for the advancement of science, and the funds paid by the members are principally devoted to publishing results of scientific research, it was naturally felt that the incomes of these societies should be tax free. However, the matter eventually was brought before the King's Bench Division on June 27th last, and the following is a report thereof, kindly sent to us by the Secretary of the British Association :—

' Mr. Justice Rowlatt : This is one of those cases which are interminable as to whether a particular institution is charitable within the meaning of the Income Tax Acts and the statute of Elizabeth. The object of this Society is undoubtedly, speaking quite broadly, in the first instance the advancement of learning and knowledge in the field of geology, and I think when that is borne in mind it narrows the issue in this case, because the advancement of learning is a charitable object. But the question here is, as I understand it, whether this Society is merely a mutual improvement society of a really private character, although, of course, being a scientific society having a reaction upon the general course of knowledge, or whether it is a society which can be described as for the general advancement of geological knowledge. As I regard the position, I think that distinction is well brought out by what the Master of the Rolls, Sir Richard Collins, said in *Smith* v. *Kerr*, in 1902 1 Chancery at page 779, and I think it is illustrated perhaps rather more distinctly by what Vice-Chancellor Wickens said in *Cocks* v. *Manners* (Law Reports, 12 Equity, page 585) with regard to religious associations. In my judgment, when that distinction is clearly understood it is a question of fact to say, if there is evidence both ways, on which side of the line a particular case falls. In this case these Commissioners have found in favour of the Crown. I think it is a case in which they could have found the other way, but I do not think it is a case in which you can say they could not have found this way. They could have found the other way, I think, on the ground that after all these people arranged for visitors or outsiders being taken in, they amalgamated their library with the University library, and they admitted learned bodies to their membership; but the Commissioners still have said quite clearly, and I think have accurately stated the issue when they stated: "In our opinion the main function of the Association is the combination of members for scientific purposes and mutual improvement and the giving and receiving of instruction among themselves and without questioning that the studies pursued by the members in co-operation tend to the increase of knowledge and indirectly to the promotion of education generally as well as other objects of public utility we hold that the Association is not a body of persons established for charitable purposes only and we accordingly disallow the claim." I think that is saying this: "We think the main object is merely instruction *inter se*; we do not deny that it has a reaction on the advancement of learning at large, but we think that that is not enough to take it out of the category of a purely private society of private individuals." That is how I read it, and on that ground I think the appeal fails. It seems to me that I am following the principle laid down in the *Yorkshire* case, certainly according to the Master of the Rolls, who says in terms that what I had done, the Commissioners having found that this Society did cater for something more than the pleasures and tastes of the members, was that I had gone contrary to that as a matter of fact, and had said I thought it was a society for the pleasures and tastes of the members, not for their pecuniary benefit, as some of the Lords Justices seem to think I was speaking of; it was catering for the pleasures and tastes of the members and merely got up because they were people who were all interested in farming and in raising good stock. I think the Master of the Rolls treated that as a question of fact, and I think this is a question of fact. Without saying I should have decided the other way, I do not think I can disturb the Commissioners have done, and therefore I dismiss this appeal.'

'MIDLAND COUNTIES INSTITUTION OF ENGINEERS *v.* COMMISSIONERS OF INLAND REVENUE. JUDGMENT. 29TH JUNE, 1928.

'MR. JUSTICE ROWLATT: In this class of case (we had one the other day in the Geologists Society's case, and now we have the case of the Midland Counties Institution of Engineers) I do not think it is very difficult to enunciate the formula embodying the question which has to be answered; the difficulty is entirely in the application. I think one may start with the very happy phrase in which Lord Watson points the contrast with which he had to deal in the Civil Engineers' case in 3 Tax Cases, at page 128. He said that in the question with which he was dealing, namely, where a

Society was for the promotion of Science, the exemption depended "upon the intrinsic character of the object which a Society promotes, and not upon the scope of the benefits which may result from its transaction." Now where the question is whether a purpose is charitable, it seems to me exactly what it does depend upon is, both the intrinsic character of the object and upon the scope of the benefits which may result, because I think everybody agrees it is of the essence of a charity that it should be for the benefit of the public. Now in these cases the intrinsic object, the advancement of a particular form of learning answering a test, the question is, what is the scope of the benefit? It seems to me it is quite clear that the two categories which have to be contrasted are these: Where the benefit is for the public and where the benefit is merely for the individuals. By the "benefit" I do not necessarily mean pecuniary benefit; I would include intellectual benefit or benefit by gratifying some taste, or giving pleasure in that way, or benefit by really improving the mind. That is at the back of what Lord Justice Rigby said in Macduff's case, when he doubted if a Trust could be charitable for education, and it did not involve education by teaching. What he meant was that it was not only the pursuit of knowledge that made the purpose charitable: it was the pursuit of knowledge combined with the diffusion of it that made the purpose charitable. That is what I understand to be the idea. That is the formula.

'Now in these cases, in order to obtain an exemption, the funds have to be devoted, not only to charitable purposes, but to charitable purposes only; so that the question which emerges in all these cases is: Is there so much personal benefit to the members, intellectual or professional, as to be incapable of being disregarded? If a substantial object of the Association in question is that its funds should benefit the members, in this case professionally or intellectually, as individuals at all, if that is substantial, then it may also benefit the public in the sense of not only giving them a better engineering profession, but also calling into existence greater knowledge, which will redound to the benefit of the public in the end. If the two objects are there, the funds are not devoted exclusively to the one object. Now I think this must be a question of fact, I said so the other day, and I think the Master of the Rolls said so the other day; he said so in the Yorkshire case. It is a question of degree and a question of fact; and there is this to be noted: Of course in the Chancery cases about charities you have got a Court dealing with law and fact. When this question was tried upon mandamus, the Court had to decide upon law and fact; but now that this jurisdiction has been transferred to the Special Commissioners and it comes before this Court by way of Special Case, this Court is bound to take note of the circumstance that you have got by law a line drawn between questions of law and questions of fact : and this Court has not authority to do more than decide the questions of law. Therefore, if the Commissioners have addressed themselves to the right question, and have not obviously gone wrong in some legal point, they cannot be interfered with.

'Now in this case I cannot escape from the view (I think it is a stronger case for the Crown than was the Geologists' case) that the Commissioners have quite appreciated the question, and they have decided it as a question of fact ; and I cannot see that they have gone wrong. What they say is, that the Institution in their view is an Association for mutual improvement in technical and professional knowledge, the acquisition of which is of direct advantage to the members in the practice of their profession. They state that as being what the Institution is for. They therefore quite clearly are treating it as not a negligible object of the Association. They say in another part that it does this at the same time : " while conducing to the benefit of the public at large through the better management of coal mines : Then they hold that : " Even if the Institution partakes to some extent of the character of a charitable Institution, it is not a body of persons established for charitable purposes only, and we disallow the claim." I do not think it was possible to hold otherwise. I think there was abundant evidence (I do not say there was not evidence both ways) to support that conclusion, which I think is one of fact, and therefore I must dismiss this appeal with costs.

(The Secretary of the British Association understands that appeals may be heard next winter.)

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Nature round House and Garden, by **W. Percival Westell.** London : The Sheldon Press, 125 pp., 2/6 net. An idea of the character of this book can be obtained from the following extracts : 'I am frequently asked the name of my favourite tree, and whilst I am fond of the queenly Beech, the brave old Oak, and that Princess among the trees, the dainty Birch, perhaps I love best of all the Scots Pine. . . . It is easy to imagine how a wounded soldier, fallen ill on his way home from the Holy Land, found a good friend in the Shepherd Elm. As he lay on his fevered couch, the Elm-tree would shelter him from sun and storm, heal his wounds, and calm his sick fancies, and they would become such comrades that, when the knight was cured and ready to depart, he would not find it hard to persuade his friend to go with him. . . . March brings not only a peck of dust, said to be worth a king's ransom, but with it comes the violet. All unannounced, these old favourites —blue and white—blossom in the old-loved spot . . . The period of watching and waiting, of anticipation, and, at last, glorious realisation, is one of the greatest of garden joys.'

GEOLOGY OF THE MALTON AREA.

H. C. VERSEY.

A RECENT visit by the Yorkshire Geological Society to the Malton Area has revealed several sections, which, by reason of their temporary character, should be recorded.

About fifty years ago, J. F. Blake described a stream section near Wharram Station, in which the Red Chalk was underlain by a ' Dark ferruginous Grit, becoming yellow and argillaceous above, passing into Red Chalk.' This rock was compared by Blake to a similar stratum at Kirby Underdale, and suggested its possible equivalence to the ' Middle Neocomian Ironsands ' in Lincolnshire. The official survey of the area by Fox-Strangways and Dakyns failed to reveal any sign of this bed.

A recent slip in Cowcliff Quarry, on the North Grimston-Wharram road, reveals a section closely resembling that given by Blake. No Red Chalk with its characteristic colour it visible, but the abundance of *Belemnites minimus* and broken *Inocerami* point to its presence in a somewhat unusual guise. It is here so much bleached that without the fossil evidence it might be mistaken for the yellowish beds of the Lower Chalk. It is noteworthy that Blake also refers to this colour change. Under this Red Chalk occur six inches of a brownish pebbly incoherent sandstone. The colour is not constant, but varies from brick-red through brown to dark green. The pebbles show a pronounced polish, and are chiefly of hard siliceous rocks. The rock, although in this attenuated development, shows a marked resemblance to the rock at Kirby Underdale, described petrographically by Mr. C. Carter and the writer, and allocated to the Carstone. Blake was, therefore, probably correct in comparing his Wharram sandstone to the Neocomian rocks of Lincolnshire, as delimited in his day, but hardly correct in placing it in the middle division.

The whole of the district round Cowcliff Quarry shows evidence of recent slipping on a very large scale, which has resulted in the shattering of the Chalk and the folding of the softer strata such as the Belemnite Marls (the Black Band) seen in the small quarry at Cowcliff. In the large quarry a plane along which this slipping has taken place is well exposed so that the lower beds of the Middle Chalk, showing a few isolated flints, are brought against the Kimmeridge Clay. It is highly probable that this plane is a fault plane of much greater antiquity in that it is in alignment with a mapped fault in the Corallian rocks of North Grimston, and further it is in alignment with a line of disturbed chalk passing near Kirby Grindalythe. It therefore increases the weight of

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evidence in favour of a continuance of the Howardian Fault System into the Wolds, and of its post-Cretaceous age.

At a cross-roads on the right bank of the Derwent at Kirkham Abbey, road widening has exposed a good section of the Whitwell Oolite, the local representative of the Millepore Limestone of the Coast. Being on a steep slope the section is disturbed by slipping, but its interest lies more particularly in the fossil contents of the rock. The neighbouring quarries at Jamie's Crag and Crambeck, from which the chief faunal lists have been compiled in the past, are now most disappointing to the collector, so that a new section is welcome. It shows a marked richness in echinoderms, while the characteristic polyzoan, *Haploecia straminea,* is common. This richness in echinoderms serves to distinguish the Whitwell Oolite from the Millepore bed of the Coast.

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THE SOUTHERN DISTRIBUTION OF POMATIA ELEGANS MÜLL.

HANS SCHLESCH.

In *The Naturalist* for April, 1926, I referred to the distribution of this species, but as the records for the southern parts of the range of its distribution were rather incomplete, I am glad to be able to make some additions.

Clessin[1] declares that it does not appear in Hungary, but that probably it may be found in the district of Banat and in the northern Croatia. Csiki[2] reports *Pomatia elegans* Müll. as living at the Lake of Balaton in Western Hungary at Fenék, Tihany and Balatonudvari, but reports that the old records for Herkulesbad in Banat and in the Fruska Gora Mountains belongs to the near related *Pomatia costulatum* Rossm. Arth. Weiss[3] also records *P. elegans* Müll. as common at the Lake of Balaton., while Kormos[4] declares that it is extinct in Hungary. I am now able to record that *P. elegans* Müll. is still living in Hungary, as it was noticed there in 1925 by my mutual friend Dr. Michael Rotarides in the vicinity of the Lake Balaton at Tihany and Fehérpart and very probably it may be recorded from several other places in Western Hungary, since it is noticed in Northern Croatia, at Zákány (now belonging to Yougoslavia), and Légrád at the River Drau in the Hungarian Komitat Somogy which forms the missing link between the occurrences at Marburg at the River Drau, the Lake of Balaton and at Wiener Neustadt. Formerly *P. elegans* Müll. has had a wider distribution in Hungary, since it was found in great numbers sub-fossil south-west from the Puszta Sátorkö in the Komitat Esztergom,[5] in the Pleistocene of Tata in the Komitat Komárom at the Danube, north-west from Budapesth[6] and also north of Danube, in the Pleistocene of Kis-Bélic and Brogyan in the former Hungarian Komitat Nyitra,[7] and Bars, now belonging to Chekoslovakia. Regarding the occurrence of *P. elegans* Müll. in the Balkans, Asia Minor and North Africa, we need further knowledge. It is known from Bulgaria, East Rumelia (Philippopel),[8] Constantinople and extend to Cilicia in Asia Minor (specimens in my collection), In Morocco it was first manifested by Kobelt from Tetuan[9] and later from Beni Saf in the Riff district.[10] Both may stand in connection with the occurrence on the Liberian peninsula and Balearic Islands. The occurrence at Constantine in Algeria and at Sfax and Djerba in Tunis probably is in relation to the occurrence at the Sicilia.

The oceanian character of this species is typical and the inland distribution and sporadic distribution in its frontier districts may be reckoned as relicts.

LITERATURE.

[1] Die Molluskenfauna Oesterreich-Ungarns und der Schweiz, 1887, p. 589.

[2] Fauna Reg. Hungar., Mollusca, 1902.

[3] Anhang zur Aufzählung der im Balatonsee und seiner Umgebung lebenden Mollusken, Result. d. wissensch. Erforschung des Balatonsees, 2 Bd., i. Teil, 1903.

[4] Beiträge zur Kenntnis der Pleistozänfauna des Komitates Nyitra, Földtani Közlöng, 41, 1911, p. 805.

[5] Geologische Aufnahme des Pilisgebirges und der beiden 'Wachtberge' bei Gran. Jahresbericht der Kgl. ungar. Geolog. Anst. von 1883, p. 131.

[6] Zur Kenntnis der Pleistocänablagerungen in der umgebung von Tata, Centralbl. f. Mineralogie etc., 1913, No. 4.

[7] Földtani Közölny, 41, 1911, p. 803.

[8] Nachrichtsbl. Deutsch. Malak. Ges., 34, 1911, p. 142.

[9] Jahrb. d. Nassau. Ver. f. Naturk., 1887.

[10] Journal de Conch., 52, 1904, p. 34.

[11] La Feuille des Jeunes Naturalistes, 1908, No. 458.

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Dr. J. Horne, formerly of the Geological Survey of Scotland, has died, at the age of 80.

In a well-known journal, under the head of 'Conchology,' some bones of mastodon are offered for sale.

Mr. B. Hobson sends the following note from the *Sheffield Daily Telegraph* of August 17th :—' While excavations for building were being made at New Mills a huge boulder of blue granite, estimated to weigh twelve tons, was found. The boulder is said to belong to the glacial period and to be the largest piece of blue granite ever found in the locality. It is proposed to move the boulder in one piece, have it cleaned and placed in front of New Mills Town Hall on the spot occupied by a German gun that was sold for scrap a few months ago.' We presume the 'blue granite' is basalt.

NOTTINGHAM MUSEUM AND ART GALLERY.

The Corporation of Nottingham recently celebrated the jubilee of the opening of the Nottingham Museum and Art Gallery. Fifty years ago the first municipal gallery in England was inaugurated, and Mr. G. H. Wallis was appointed Curator. After half a century Mr. Wallis still has charge of the collections, there having been no change in the curatorship during the period.

The jubilee was celebrated by a ' choice and representative exhibition of works of art,' which was opened by Sir Charles Holmes, Director of the National Gallery, London, and by a luncheon which, incidentally, lasted beyond the hour for ' afternoon tea,' which was given to many of the guests.

At the luncheon a few of the old friends of the Curator were invited, including the present writer.

In opening the exhibition, Sir Charles Holmes remarked that we must recognise the appropriateness of a collection in any city having some relation to the industries of that city. In Nottingham, with its great textile industry, its collection of textiles should be one of the chief objects. Everything which bore upon the industry or art of weaving, from the oldest times to the present day, ought not to be there as objects of general culture so much as actual inspirations to the people who were to make the designs in the future, and give the work produced in Nottingham that necessary element of novelty which would help it to find new markets as old ones disappeared.

Sir Charles counselled collectors not easily to be too content. It was impossible for Nottingham to cover the whole field of knowledge. As a collection he would imagine this to be one of the most catholic of all outside London, but that very catholicity carried with it a certain danger. If those responsible for it imagined that they could be authorities on all the varied branches of art represented here and still carry on the affairs of a busy life, they were probably mistaken. It was impossible, in these days of specialisation, for men to learn more than a small amount about the arts in general, and perhaps a tolerable amount about one branch of the arts in particular.

' The death duties may be the best incentive to true patriotism and to the enjoyment of your money while you have it,' concluded Sir Charles.

We must congratulate Mr. Wallis on the wonderful support he receives to his work in Nottingham.—T.S.

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S. S. Buckman figures *Ammonites* [*Hildoceras*] *walcotii* from Whitby in *Type Ammonites* for April.

YORKSHIRE NATURALISTS AT EASINGTON AND SPURN.

F. A. MASON, F.R.M.S., AND W. H. PEARSALL, D.Sc., F.L.S.

The three hundred and fortieth meeting of the Yorkshire Naturalists' Union was held at Easington from May 26th to 28th. The excursion was favoured by the weather, and there was a good attendance. In addition to the natural interests of the district, members had the opportunity of examining the antiquarian collections in the tithe barn, which has been fitted up as a folk-lore museum by Mr. T. Sheppard, the Director of the Hull Museums. Our members were the first to visit the barn in its new capacity. The general meeting was held in the tithe barn, under the chairmanship of Mr. Sheppard. After the presentation of the reports, hearty votes of thanks were accorded to Mr. T. Stainforth and Mr. T. Sheppard who had carried out the local arrangements. Two new members were elected.

Conchology (Greevz Fysher) :—Thanks to the assistance of Mrs. Morehouse and Mr. Fierke, fairly copious observations were made of terrestrial, fresh water and marine mollusca.

Helix aspersa was very abundant among nettles, and in some cases freely exposed upon the spire of the church and over stone walls, though, as hinted by a passing neighbour, they appeared entirely to avoid brick walls. Mr. Wattam reported that this species is so abundant not far from Spurn Point itself that it was difficult to find a place for the foot without treading on some of them. The markings of those seen were as usual very various, but those of an extremely dark colour appeared a good deal more numerous in proportion than usual.

Mrs. Morehouse has contributed the following list of varieties of *nemoralis*, and continues with other species, both land, freshwater and marine.

Helix nemoralis v. *libellula*
,, ,, v. ,, s.v. *cuvieria* 00300
,, ,, v. ,, s.v. *schroeteria* 02345
,, ,, v. ,, s.v. *gronovia* (123) (45)
,, ,, v. ,, s.v. *reaumuria* 123 (45)
,, ,, v. ,, s.v. *poiretia* (12) 3 (45)
,, ,, v. ,, s.v. *argenvillea* 10345.
,, ,, v. ,, s.v. *brotia* 00340.
,, ,, v. ,, s.v. *fremingvillea* 02300
,, ,, v. ,, s.v. *rumphia* 00345
,, ,, v. ,, s.v. — 023(45)
,, ,, v. *carnea* 003 : 5.
,, ,, v. ,, 12345.
,, ,, v. ,, 123(45)
,, ,, v. ,, (12)345.
,, ,, v. *rubella*
,, ,, v. ,, s.v. *guettardia* 00300.
,, ,, v. ,, s.v. *rosea quinque-fasciata* 12345.
,, ,, v. ,, 12045
,, ,, v. ,, 120(45)
,, ,, v. ,, 10305.
,, ,, s.v. *quinque fasciata* 12345
,, ,, s.v. *argenvillea*
,, ,, s.v. *falsania*
,, ,, v. *fasciata* s.v. *coalita*.

Helix nemoralis v. *studeria* s.v. *purpureo-tincta.*
,, ,, v. *minor* (various)
,, ,, v. inclined to *undulata.*
flammea effect of bands in some.

Arianta arbustorum.
Hygromia rufescens.
Xerophila virgata.
Limnea truncatula.
L. peregra.
L. peregra var. *acuminata* (Mr. Wattam).
L. stagnalis.
Pisidium fontinale.
P. fontinale var. *pulchella.*
Planorbis contortus.
P. spirorbis.
Physa fontinalis.
Sphærium lacustre.
S. corneum.
Succinea putris.

MARINE.

Pecten pusio.
Mytilus edulis.
Vulsella modiolus.
Scrobicularia piperata.
Gibbula (Trochus) cineraria.
G. tumida.
Calliostoma zizyphinus.
Purpura lapillus.
Buccinum undatum.
Mya arenaria.
Littorina littorea.
L. rudis.
Macoma balthica.
Anomia ephippium.
A. patelliformis.
Ostrea edulis.
Cardium edule var. *rusticum.*
C. fasciatum.
C. echinatum.
Neptunea (Fusus) antiqua.
Rissoa parva var. *interrupta.*
Mactra stultorum.
Lacuna divaricata.
Cylichna umbilicata.
Chiton.

A small pond on the road from Easington to the Humber Side, a good deal of which was on a muddy bottom without vegetation, although some watercress was growing in another part of the pond, yielded many Bivalves, but Mr. Stelfox, of the Irish National Museum, finds they only contain the following four species :—

Sph. lacustre	50 per cent.
Pisidium obtusale	49 per cent.
P. personatum	
P. subtruncatum	

He remarks ' It is a curious association as *subtruncatum* does not often occur without either *nitidus* or *milium* ; nor do *obtusale* and *personatum* often occur together without *casertanum* also.

A much larger pond within the adjoining field amply provided with several species of aquatic plants, yielded only the two species *Limnea peregra* and *Sph. corneum*, both fairly abundant, but even after prolonged dredging appeared to be the only molluscan occupants.

In the Warren, near the beginning of the Spurn Peninsula, a swampy place filled with deep elastic moss, *nemoralis* was very abundant, and in this situation they can probably be collected plentifully even in the driest weather.

H. aspersa, as is well known, belongs to the pentatæniate or 5-banded group, and though the shell ' sculpture is constituted by strong growth lines and a plexus of coarse irregular and deep wrinklings ' (Taylor's Monograph, p. 237), the ordinary character of the banding is indicated by the formula 1(23)45. Mr. H. J. Armstrong reports that those submitted are mostly type specimens 12345, ranging from dark to light colour, although a few are banded (123) 45, in some cases the 4.5. bands are very narrow. A few are, I think, of the var. *undulata*, being marked with dark and light alternate undulatory markings.

Mr. Sheppard had called attention to the fact that it had been reported that the Humber had been invaded by the American edible clam *Venus mercenaria.* This and *Crepidula fornicata*, also introduced from

U.S.A., are said to be at times obtained by the Cleethorpes oyster dredgers. No specimens of either species were seen among the numerous shells left by the tide on the Humber beach near Spurn.

ENTOMOLOGY (J. M. Brown) :—Insects were neither so numerous nor perhaps so interesting as might have been expected. Those taken belonged generally to the commoner species which might normally be looked for in similar localities. Several species appear to be new to the county, those in the Diptera list by Mr. C. A. Cheetham, and the Homopteron, *Stiroma nigrolineata* Scott, taken at Spurn by the writer.

Though no particular search was made for Collembola on this occasion, they seemed distinctly scarce. This may have been due to the dry sandy nature of the ground in the greater part of the area investigated. The species noted were *Sminthurus viridis* (L.), *Isotomurus palustris* (Müll.), *Orchesella cincta* (L.), and *Entomobrya nivalis* (L.).

The Orthoptera were represented by the common Earwig (*Forficula auricularia* L.), numerous families of immature individuals of which were seen under stones, and the Cockroach (*Blatta orientalis* L.) taken in Welwick Church.

One Dragonfly only, *Pyrrhosoma nymphula,* was obtained by Mr. Wattam at Welwick.

Owing, perhaps, to the absence of woods, and to the cold season, Hemiptera were poorly represented, very few of the more conspicuous bugs being seen. Of the Heteroptera the following were taken: *Notochilus contractus* H.S. under stones at Spurn (this still being the only Yorkshire locality), *Stygnocoris fuligineus* Geoff., *Monanthia cardui* L. (rather strangely swept from grass), *Miris calcaratus* Fall., *Liocoris tripustulatus* F., *Corixa nigrolineata* Fieb., *C. semistriata* Fieb., *Velia currens* L., and, on the Humber Flats, some immature *Salda*. The Homoptera were rather more plentiful in individuals, and included *Agallia puncticeps* Germ., *Athysanus plebejus* Fall., *A. lineolatus* Br., *Delphax pellucida* Fab., *D. discolor* Boh., *Stiroma affinis* Fieb., and *S. nigrolineata* Scott, this last being new to the county.

Hymenoptera seemed distinctly scarce, very few bees and still fewer wasps being seen by the recorder. Ants were more numerous, and *Myrmica lævinodis* Nyl., *M. ruginodis* Nyl., *M. scabrinodis* Nyl., and *Formica fusca* L. were taken.

The Butterflies included the Large and Small Whites, Small Tortoiseshell, and Orange Tip, while the more conspicuous Moths were represented by the Cinnabar and Garden Carpet. More noticeable were the larvæ of the Drinker, Oak Eggar, Tiger, Burnet, Magpie and Gold-tail Moths, which were particularly numerous on the way to Spurn.

The Coleoptera were undoubtedly the most numerous of the insects taken, and nearly one hundred species were collected at Spurn and Welwick. *Broscus cephalotes* was common under refuse on the shore, and *Notoxus monoceros* on the sandhills, near Spurn. The Death-watch Beetle, *Xestobium rufo-villosum,* was unfortunately too numerous in the old timbers of the Tithe Barn, and also in the old woodwork in the church, Easington; while the Churchyard Beetle (*Blaps mucronata*) and *Niptus hololeucus* were taken in Welwick Church. The following list includes those species taken by Mr. Hincks and the writer, with the exception of a number the identity of which requires confirmation :—

Notiophilus biguttatus.
N. 4-punctatus.
Loricera pilicornis.
Broscus cephalotes.
Bembidion 4-guttatum.
B. varium.
B. mannerheimi.
B. nitidulum.
Harpalus æneus.
Amara plebeia.
A. tibialis.
A. familiaris.
A. communis.
Abax ater.
Pterostichus niger.
P. madidus.

Calathus mollis.
C. melanocephalus.
Agonum dorsale.
Dromius linearis.
Demetrias atricapillus.
Hydroporus planus.
Helophorus aquaticus.
Tachinus rufipes.
Tachyporus hypnorum.
T. obtusum.
Creophilus maxillosus.
Staphilinus brunnipes.
Stenus rogeri.
S. impressus.
Oxytelus rugosus.
Lesteva pubescens.
Saprinus æneus.
Epuræa melina.
E. depressa.
Omosita colon.
Corticaria pubescens.
Rhizobius litura.
Byrrhus pilula.
Aphodius fimetarius.
A. ater.
Geotrupes stercorarius.
Ægialia arenaria.
Athous hæmorrhoidalis.
Agriotes sobrinus.
A. obscurus.
Helodes marginata.
Niptus hololeucus.
Xestobium rufo-villosum.
Chrysomela staphylea.
Phædon cochleariæ.
Sphæroderma testaceum.
Cassida viridis.
Otiorrhynchus ovatus.
Phyllobius oblongus.
P. pomonæ.
Sitona lineatus.
Cneorrhinus plagiatus.
Cleonus piger.
Cidnorrhinus 4-*maculatus.*
Ceuthorrhynchidius troglodytes.
Mecinus pyraster.
Apion apricans.
A. violaceum.
A. æthiops.
Rhynchites minutus.
Rhinosimus viridipennis.
R. planirostris.
Notoxus monocerus.
Blaps mucronata.
Phylan gibbus.

Arachnida : Several common spiders were taken casually, while the Harvestman, *Platybunus corniger* Herm., and the Pseudoscorpions, *Chthonius tetrachelatus* (Pres.) and *C. rayi* Koch occurred at Spurn.

Woodlice were very plentiful, especially the Pill-woodlouse, *Armadillidium vulgare* Latr., which was extraordinarily abundant along the railway track to Spurn, while *Oniscus asellus* L., *Philoscia muscorum* Scop., and *Porcellio scaber* Latr. were common.

Coleoptera (T. Stainforth) :—My captures of Coleoptera at the Spurn meeting included nothing unrecorded for the area. It was, however, to me a new experience to find that very fine British weevil, *Cleonus piger*, occurring in such numbers among the Marram Grass, or occasionally feeding upon the leaves of Burdock. Many of the examples occurred *in copula* on the sand among the grass stems, their scheme of colouration matching closely that of the sand. *Timarcha coriaria* was common also on patches of the Yellow Bedstraw, on which I found its eggs. It was, I think, too early for the larva which later in the summer is usually common on this food plant. *Broscus cephalotes* found wonted lodgment under old baskets, ships' fenders, and driftwood, everywhere along the Humber side of Spurn. Associated with this dangerous neighbour were examples of *Calathus fuscus*, I took also *Phylan* (*Heliopathes*) *gibbus*, *Ægialia arenaria*, and *Helops læviocto-striatus.*

Diptera (C. A. Cheetham) :—The following Diptera were taken on Kilnsea Warren before noon ; unfortunately there was very little sunshine at the time and Syrphids were scarce. Eight of them are additions to the county list, and many of them have not been recorded from the East Riding previously. The species which dominated the sweeping captures was *Hydrellia griseola* Fal. ; this must be exceedingly abundant. Another interesting species, *Mydæa protuberans* Ztt., occurred on the larger grasses in the more sandy parts, generally one or at most two to each plant, and not flying high, but dropping on to the sand a foot or two away when disturbed. This species appeared in the list from the sandhills at Redcar.

Sciara carbonaria Mg.
Sciophila nigra Landrock.
Scatopse notata, L.
Dilophus febrilis L.
D. humeralis Ztt.
Bibio marci L.
Limnobia dilutior Edw.
Rhiphidia maculata Mg.
Dicranomyia mitis Mg.
Symplecta stictica Mg.
Pachyrrhina lineata Scop.
Tipula oleracea L.
Rhyphus punctatus F.
Rhamphomyia sulcata Fal.
R. dissimilis Zett.
Pachymeria femorata F.
Hilara maura F.
Clinocera stagnalis Hal.
Ardoptera irrorata Fal.
Tachydromia nigritarsis Fal.
Syntormon pallipes F.
Chilosia pulchripes Lw.
C. cynocephala Lw.
Platychirus manicatus Mg.
P. angustatus Ztt.
Melanostoma mellinum L.
Sphærophora menthastre L.
Ascia podagrica F.
Eristalis arbustorum L.
E. horticola Deg.
Helophilus pendulus L.
Morellia hortorum Fal.
M. ænescens R.D.
Calliphora erythocephala Mg.
Lucilia cæsar L.
Mydæa duplicata Mg.
M. protuberans Ztt.
Dexiopsis lacteipennis Ztt.
Hydrotæa occulta Mg.
H. dentipes, Mg.
Hylomyia puttuta Ztt.
H. fugax Mg.
Azelia cilipes Yal.
Cœnosia nigridigitata Rnd.
Fucellia fucorum Hal.
Lucina fasciata Mg.
Blepharoptera modesta Mg.
Ditænia cinerella Fal.
Piophila varipes Mg.
Hydrellia griseola Fal.
Scaptomyza tetrasticha Bkr.
Drosophila fenestarum Fal.
Meromyza nigriventris Mcq.
Agromyza flaveola Fal.
Ochthiphila polystigma Mg.
Napomyza lateralis Fal.
Limosina zosteræ Hal.

Mr. W. D. Hincks collected some Diptera at Welwick, where he was fortunate in taking *Tropidia scita* Harr., a very welcome addition to the county list. Others, which are not in the foregoing list are :—

Xephandrium appendiculatum Ztt.
Empis tessellata F.
E. trigramma Mg.
Leucozona lucorum L.
Rhingia campestris Mg.
Sarcophaga carnaria L.

BOTANY—FLOWERING PLANTS (W. H. Pearsall) :—The Spurn district is well known botanically, and little was added to the plants known to occur there. One curious feature of the Spurn sand dunes is that there is little definite evidence of changes in the plant covering as the age of the dunes increases—that is, working northwards. The dune vegetation appears to become approximately stable as soon as the stage of *Hippophæ* scrub is reached. The number of species present appears to become much higher where there is human influence, particularly at the south end. The most interesting species observed were *Vicia lathyroides, Elymus arenarius, Rubus discolor,* and a white-flowered *Erodium cicutarium.*

The second area of great interest visited was the Welwick salt marsh. The ecology of this area would well repay detailed work. On the outer part *Glyceria maritima* was usually dominant, especially where the water level was high. Along the drains, however, *Atriplex portulacoides* became dominant, where the water level was lowest. This arrangement is probably characteristic of muddy, poorly drained salt marshes, and it is in marked contrast with that on sandy and well drained marshes like those of North Lancashire. In the latter case, *Atriplex portulacoides* is found away from the drains where the soil water is nearest the surface.

The inner parts of this salt marsh, nearest the sea wall, show a curious mixture of species. The water level is high at or near the surface, but the water less salty. *Enteromorpha* sp., *Triglochin maritimum* and *Cochlearia* spp., were almost equally abundant, along with frequent *Salicornia europea* and *Limonium vulgare.*

The following additional species were seen here or along the shore : *Spergularia media, S. salina, Ruppia maritima, Carex distans, Ranunculus drouetti, Cerastium viscosum, Trifolium dubium.*

Bryology (F. E. Milsom) :—The mosses generally were in a very dried-up condition, owing to the dry sandy nature of the peninsula. The one small piece of marsh near the Warren was filled with *Hypnum fluitans,* to the apparent exclusion of other bryophytes. Only two hepatics were found, and they were of the commonest. One would prefer to visit Spurn either earlier or much later in the season in order to ' bryologise ' successfully.

Below is a list of species noted by Mr. W. H. Burrell and the writer :—

Mosses.

Ceratodon purpureus.
Tortula ruralis.
T. ruraliformis.
Barbula revoluta.
B. convoluta.
B. fallax.
Bryum pendulum.
B. capillare.
Fissidens bryoides.
Weisia viridula.
Pottia heimii.
Physcomitrium pyriforme.
Brachythecium albicans.
B. rutabulum.
B. purum.
Hypnum fluitans.
H. adhuncum (group *pseudo-fluitans*).

Hepatics.

Pellia epiphylla.
Lophocolea bidentata.

Plant Galls (J. M. Brown) :—Plant galls were not numerous and few were taken. In addition to the fungus galls noted in the report of the Fungi, the following were the most interesting : *Aulacidea hieracii* Bouche, on *Hieracium* sp., *Aulax hypochæridis* Kieff. on *Hypochæris radicata, Cryptosiphum artemisiæ* Pass. on *Artemisia vulgaris,* and *Tylenchus* sp. on *Plantago maritima.*

(*To be continued*).

YORKSHIRE NATURALISTS AT RICHMOND.

F. A. MASON, F.R.M.S., AND W. H. PEARSALL, D.Sc., F.L.S.

Considering that unpropitious events led to the necessity of fixing headquarters for this excursion so far from the area for investigation as Darlington, the 343rd meeting was well attended. The weather was favourable, and the programme was fully carried out, and even extended by the ornithologists, who, under the optimistic guidance of Mr. H. B. Booth, made a brave attempt to reach far-off Mickle Fell. With the exception of Geology, the Sections were well represented in the field, and the excursions proved to be of great general interest, although few new records were made except by the entomologists and the growing band of enthusiasts in the study of plant galls.

On Saturday, August 4th, led by Mr. G. Burgess, parties worked through Whitcliffe Woods, and a small area of Billybanks Wood on the banks of the Swale. The following day, still under the guidance of Mr. Burgess, both banks of the Greta from Greta Bridge as far as the Mill were traversed. The return journey, along the right bank of the river, was perhaps the only occasion in the history of the Union when its members have been mistaken for a band of poachers. In the absence of vertebrate zoologists, and the presence of a good sprinkling of ladies in the party, it is difficult to account for such an error of judgment, and one can only speculate that the ambiguous movements of the mycologists aroused the suspicions of an irate farmer, who, at a distance of a field away, demanded explanations ! An interview elicited the nature of the suspicions mentioned above, but the peaceable character of our business being explained, courteous permission to proceed was readily conceded.

Monday was devoted to the exploration of Aske Park and Black Plantation, including Aske Beck, Mr. C. P. Nicholson acting as guide. A general meeting was held at headquarters in the evening, at which Mr. H. B. Booth presided. Sympathetic reference to the loss sustained by the Union through the death of Johnson Wilkinson was made from the chair. An ornithologist of international reputation, Johnson Wilkinson had for many years acted as treasurer of the Wild Birds and Eggs Protection Acts Committee, and at his funeral, at Huddersfield, the Union was represented by Mr. F. H. Edmondson and others, a wreath having been sent on behalf of the Executive by the Hon. Secretaries.

Reports on the work of the meeting were submitted by Messrs. J. M. Brown, W. J. Forrest, Greevz Fysher, Miss M. Hewlett, Messrs. J. E. Nowers, F. A. Mason and M. L. Thompson. Cordial votes of thanks were given to the landowners who had granted permission to visit their estates. On behalf of the Executive, Mr. F. A. Mason expressed his regret at the continued illness of their Local Secretary, Mr. J. Hartshorn, and the indebtedness of the Union to Mr. J. E. Nowers and his Darlington associates, Messrs. G. Burgess and C. P. Nicholson. Moved as a resolution of thanks, it was seconded by Mr. D. Persy Fisher and unanimously carried by the meeting. Mr. Hans Schlesch, the eminent Danish conchologist, was elected to membership.

Botany (Miss M. Hewlett).—In the absence of any list of the plants of the district in the records of the local societies, the nature of the flora may be gathered from the following seen during the three excursions :—

Whitcliffe Woods.

Trees :
  Oak.
  Sycamore.
  Ash.
  Elm.
Shrubs :
  Holly.
  Hazel.
  Bramble.
  Dogwood.
  Guelder Rose.
Herbs :
  Enchanter's Nightshade (abundant).
  Bluebell (abundant).
  Dog's Mercury (abundant).
  Oxalis acetosella.
  Nepeta hederacea.
  Yellow Pimpernel.
  Veronica officinalis.
  V. montana.
  Cirsium lanceolatum.
  Ragwort (abundant).
  Goosegrass (abundant).
  Epilobium montanum.
  E. angustifolium.
  E. lanceolatum.
  E. hirsutum.
  E. angustifolium.
  Carex remota.
  Campanula latifolia.
  Geranium sylvaticum.
    On Clearings—
  Sonchus asper.
  Scabiosa arvensis.
  S. succisa.
  Hypericum quadrangulum.
  H. perforatum.
  Tamus communis.

———

  Aspidium filixmas.

———

Mosses :
  Catharinea undulata (on clay).
  Fissidens adiantoides.
  Camptothecium sericeum.
  Mnium hornum (commonest).
  Plagiothecium undulatum.

Pasture above Whitcliffe Woods.

Juncus bufonius. *Scirpus setaceus.* *Achillea ptarmica.*

Sandy Patch near River below Whitcliffe Woods.

Erigeron acris (Fleabane).
Dyer's Green-Weed.
Malva sylvestris.
Marjoram.
Mullein.
Centaurium umbellatum.
Ranunculus flammula.
Mimulus (on River Bank).
Agrimony.
Ononis repens.
Arenaria tenuifolia.
Cochlearia alpina (on River Bank).
Hieracium pilosella.
Leontodon autumnalis.
Linum catharticum.
Solidago.
Silene inflata.
Silaus flavescens.

Cronkley Fell.

The following plants are well known in this locality, but the list is a record of those flowering at this date :—

Sedum villosum.
Potentilla fruticosa
Narthecium ossifragum.
Saxifraga azoides.
Grass of Parnassus.
Viola amœna.
Sundew.
Butterwort.

Brignall Banks, Rokeby ; Walls of Old Church.

Linaria cymballaria.
Grimmia pulvinata.
Bryum capillare.
Camptothecium sericeum.
Funaria hygrometrica.

Rokeby.

Orchis maculata (Pasture).
Conium maculatum.
Geranium lucidum.
G. sylvaticum.
Rubus saxatilis.

Aske.

Helleborine latifolia.
Twayblade.
Scrophularia aquatica.
S. nodosa.
Hypericum pulchrum.
Ribes alpinum.
Orchis maculata.
Carex hirta.
Geum rivale.
G. urbanum.
Ranunculus tricophyllus.
Mnium undulatum.

Vertebrate Zoology (Mr. H. B. Booth).—As is usual at this time of the year, birds were very quiet, and the number seen was comparatively small. Among those noted were the Wheatear, Dipper, Goldfinch (twice), Goldcrest, Grey Wagtail, Carrion Crow, Swift, Nightjar (killed by a Hawk or Falcon), Sparrow Hawk, Tawny Owl, Kingfisher, Stock-dove, Heron, and on the lake in Aske Park, Coots and the Little Grebe. The Wren and the Yellow Hammer appeared to be exceptionally numerous. There were also two noticeable facts—(1) the number of Black-headed Gulls (which are chiefly scavengers) on the boasted pure waters of the Swale at Richmond ; (2) the scarcity of Spotted Flycatchers in Aske Park (a most suitable habitat), and the great abundance of flies present, to the annoyance of visitors.

Nothing special was seen in the other sections of Vertebrate Zoology. The device in string, and the rags soaked with chemicals, around Black Plantation, in order to keep foxes out, was examined with interest.

Mollusca (Mr. Greevz Fysher).—On Monday, at Aske Park, the ornamental pond gave an opportunity for obtaining some of the aquatic forms, but the shallow water and the prevalence of floating alga afforded very few species. Later in the day a pond at Forcett, not mentioned in the circular, was discovered by the aid of a map. This extensive water would probably repay a longer and more extended visit. Near the embankment at the foot of the pond, though the number of species taken was comparatively few, the locality is really remarkable for the enormous number and crowded distribution of *Sphærium corneum.* One scoopful of mossy water-weed was exhibited at the meeting, and was regarded as a record of the crowding of this species.

Mrs. Hutton found a few aquatic species in the ornamental water of South Park, Darlington.

Mr. Sargent, of Darlington, contributed a gathering of sub-fossil species from Oxney Flats Croft, and the following is a complete list from the different localities ascertained by Mr. J. A. Hargreaves :—

Darlington (August 3rd) : Three _Limnea truncatula_, many _L. peregra_, four _Sphærium corneum._

Hudswell Bank (August 4th) : _Hygromia striolata_, _Arianta arbustorum_, _Pyramidula rotundata_, _Hyalinia cellaria_, _H. alliaria_, two _H. lucida_, _Vitrea crystallina_, _Vitrina pellucida_, one _Clausilia bidentata._

Greta (August 5th) : Four _Clausilia cravenensis_, three _Arianta arbustorum_, very young ; three _Ashfordia granulata_, two _Limax maximus_, one _Clausilia bidentata_, one _C. cravenensis_, one _Cochlicopa lubrica_, two _Vitrea crystallina_, _Hyalinia alliaria._

Aske (August 6th) : One _Limnea auricularia_, _Planorbis albus_, very fine ; _Physa fontinalis_, one _Spherium corneum._

Forcett (August 6th) : _Spherium corneum_, _Limnea auricularia_ var. _acute_, _Planorbis albus_, one _Valvata piscinalis._

Oxney Flats Croft : _Limnea stagnalis_, _L. pereger_, _L. palustris_, _Planorbis umbilicatus_, _Bythinia tentaculata_, one _Valvata cristata_, three _Hygromia hispida_, one _Hyalinia nitidula._

ENTOMOLOGY, ETC., OF BUTTERCRAMBE WOODS, E. YORKS.

W. D. HINCKS, M.Ph.S.

An interesting field meeting of the Entomological and Plant Galls Sections of the Yorkshire Naturalists' Union was held on June 23rd at Buttercrambe Woods, near Stamford Bridge. Insects were abundant and the locality a good one, and, favoured by the good weather, members returned with good ' bags.'

The following notes have been received.

Mr. M. L. Thompson reports having met with about fifty species of Coleoptera, of which the following may be mentioned :—

Quedius maurorufus Gr.
Philonthus nigrita Gr.
Galerucella lineola F.
Mantura obtusata Gyll.
Haltica oleracea L.
Anaspis geoffroyi Müll.

Mr. C. A. Cheetham sends the following list of Diptera.

*=New to Vice County 62 ; **=New to County.

*_Sciara caudata_ Wlk.
Boletina trivillata Mg.
*_Tetragoneura sylvatica_ Curt.
Polylepta guttiventris Ztt.
*_Mycomyia incisurata_ Ztt.
**_Platyura discoloria_ Mg.
*_Simulium equinum_ L.
*_Cuticella fumipennis_ Stph.
**_Ochlerotatus rusticus_ Rossi.
*_Ptychoptera minuta._
Limnobia quadrinotata Mq.
L. nubeculosa Mq. Tonn.
Dicranomyia dumetarum Mq.
Rhiphidia maculata Mg.
*_Helius longirostris_ Mg.
*_Empeda nubila_ Schum.
Molophilus bifilatus Verr.
Ormosia nodulosus Mg.
*_Limnobia dispar_ Mg.
L. fulvonervosa.
L. ochracea Mg.
*_Ula macroptera_ Mcq.
Pachyrrhina lineata Scop.
*_P. analis_ Schum.
Tipula unca Wild.
P. scurra Mq.
T. lunata L.
T. scripta Mq.
T. paludosa Mq.
*_Sargus cuprarius_ L.
Microchrysa polita L.
Beris chalybeata Först.

***Therioplectes tropicus* Mg., var. *bisignatus* Jænk.
Chrysopilus cristatus Verr.
Rhamphomyia flava Fal.
***R. nigripennis* F.
Empis livida L.
**Hilara interstincta* Fal.
**Œdalea stigmatella* Ztt.
**Œ. holmgreni* Ztt.
Tachydromia coarctata Coll.
Ardoptera irrorata Fal.
**Cheilipoda melanocephala* F.
Psilopus platypterus F.
***Dolichopus lepidus* Staeg.
D. ungulatus L.
D. popularis Wild.
**Hypophyllus crinipes* Staeg.
**Gymnopternus cupreus* Fal.
**Chalarus spurius* Fal.
Pipunculus campestris Ltr.
**Pipizella flavilarsis* Mg.
**Chilosia variabilis* Pz.
**Platychirus scambus* Staeg.
Pyrophaena granditarsa Först.
**Syrphus cinctus* Fal.
Baccha elongata F.
Sphegina clunipes Fal.
**Ascia dispar* Mg.
A. geniculata Mg.
Helophilus pendulus L.
Xylota segnis L.
**Metopia leucocephala* Rossi.
Morinia nana Mq.
**Mydæa marmorata* Ztt.
Phaonia basalis Ztt.
**P. scutellaris* Fal.
P. pallida F.
Allæostylus diaphanus Wild.
Mydæa quadrum F.
M. tincta Ztt.
***Pegomyia virginea* Mg.
**P. præpotens* Wild.
Lasiops semicinereus Wild.
**Hydrophoria conica* Wild.
**Prosalpia sylvestris* Fal.
Hydrolæa irritans Fal.
Azelia cilipes Hal.
**Cordylura pudica* Mg.
**Scatophaga maculipes* Ztt.
Suilla bicolor Ztt.
**S. flava* Mg.
S. notata Mg., var. *hilaris*.
Neoleria inscripta Mq.
Heteroneura albimana Mq.
**Phæomyia fuscipennis* Mq.
Telanocera elata F.
T. lævifrons Lw.
T. sylvatica Mg.
**T. punctulata* Scop.
Micropeza corrigiolata L.
Palloptera umbellatarum F.
Nemopoda cylindrica F.
Notiphila riparia Mg.
Parhydra quadripunctata Mq.
***Phora tincta* Schmitz.

HEMIPTERA.—Mr. J. M. Brown reports adult Hemiptera were not very plentiful, but immature individuals were more common, among which the most interesting was a single example of *Rhacognathus punctatus* L., which I obtained by beating. Mr. Walsh tells me that he obtained this species in these woods last year. This constitutes a new county record.

HETEROPTERA.

Rhacognathus punctatus L. One immature specimen.
Elasmostethus interstinctus L. Several beaten from Birch.
Anthocoris nemorum L. and *confusus* Reut. Common.
Calocoris ochromelas Gmel. Not plentiful.
Lygus campestris L. Several particularly brightly coloured.
Stenodema calcaratum Fall., *lævigatum* L., and *holsatum* F. Among grass and low plants.
Monalocoris filicis L. On Bracken.
Dicyphus stachydis Reut.
Cyllocoris histrionicus L.
C. flavoquadrimaculatus De G.
Harpocera thoracica Curt. On Oak.
Psallus betuleti Fall.
P. variabilis Fall.
P. varians H.S.
Velia currens F.

HOMOPTERA.

Oncopsis flavicollis L. On Birch.
Batrachomorphus lanio L. Immature specimens.
Acocephalus nervosus Schr.
Cicadula 6-notata Fall. Common in grass.
Eupteryx vittatus L.
E. auratus L.
E. atropunctatus Goeze.
E. signatipennis Boh.
Cixius pilosus Ol.
C. nervosus L.

Delphax forcipata Boh.
Dicranotropis hamata Boh.
Stiroma pteridis Boh. On Bracken.
Aphalara nebulosa Zett. On *Epilobium angustifolium.*

Psocoptera were fairly numerous, but not many species were represented. Those taken included :—

Mesopsocus unipunctatus Müll. Common.
Elipsocus hyalinus Steph.
E. cyanops Rost. Very plentiful on *Abies.*
Cæcilius flavidus Steph.
C. burmeistera Brauer.
C. obsoletus Steph.
Psocus fasciatus Gabr.

The Orthoptera were represented by the Earwig and one species of Grasshopper, *Tettix bipunctatus* L., taken by Mr. Cheetham.

The Neuroptera included :—

Coniopteryx tineiformis Curt.
Hemerobius nitidulus Fabr.
H. limbatellus Zett.
Chrysopa perla L.
C. alba L.
Panorpa germanica L.
P. communis L.

Plant Galls.—Perhaps the most interesting gall was that caused by *Rhopalomyia tanaceticola* Karsch on the Tansy, obtained by the river side at York.

The following list includes those collected by Miss Pilkington :—

On Oak : *Biorrhiza pallida* Oliv., *Neuroterus baccarum* L., *N. albipes* Schr., *Andricus curvata* Hart., *Cynips kollari* Hart., *Macrodiplosis dryobia* Löw., On Alder : *Eriophyes lævis* Nal. On Elm : *Oligotrophus leemei* Kief. On Meadow-sweet : *Perrisia ulmariæ* Brem., *Triphragmium ulmariæ* Wint. On *Veronica montana* : *Perrisia veronicæ* Fall. On *Epilobium angustifolium* : *Aphalara nebulosa* Zett. On Box : *Psylla buxi* L. On *Picea* : *Chermes bietisk.*

Mr. W. D. Hincks records the following Coleoptera.

Stenus clavicornis Scop.
S. impressus Germ.
Anthobium torquatum Marsh.
Catops watsoni Spence.
Cychramus lutea F.
Epuræa melina Er.
E. depressa Gyll.
Meligethes æneus F.
Trixagus dermestoides L.
Cyphon paykulli Guer.
C. variabilis Thunb.
Hydrocyphon deflexicollis Müll.
Malthodes minimus L.
Malthinus fasciatus Ol.
Malachius bipustulatus L.
Plateumaris sericea L.
Chrysomela staphylea L.
C. polita L.
Luperus rufipes Scop.
Galerucella tenella L.
G. nymphææ L.
Hippuriphila modeeri L.
Rhyuchites betulæ L.
Apion violaceum Kirb.
Phyllobius viridiæris Larch.
Polydrusus cervinus L.
P. micans F.
Sciaphilus muricatus F.
Dorytomus pectoralis Gyll.
Cionus alauda Hbst.
C. scrophulariæ L.
Anaspis maculata Fourc.
A. frontalis L.
A. nifilabris Gyll.
A. geoffroyi Müll.

Mr. J. M. Brown adds :—

Stenus flavipes Steph.
Helodes marginata F.
Byturus tomentosus F.
Microcara testacea L.
Cyphon coarctatus Payk.
Rhagonycha lignosa Müll. (*pallida* Fab.).
Chrysomela graminis L. Taken by Mr. Hincks by the river, York.
Anthribus (*Brachytarsus*) *variegatus* Fourc.
Liophloeus tessulatus Müll.
Phytonomus nigrirostris F.
Cidnorrhinus 4-*maculatus* L.
Cionus scrophulariæ L.
C. alauda Hbst. (*blattariæ* F.)

NEWSPAPER SCIENCE.

In the *Daily Chronicle* for August 7th, after innumerable headlines in large type, we learn that in one of the Chedder Caves a piece of reindeer antler has been found bearing markings and perforations similar to some found on the continent, which by certain authorities are considered to have been used for straightening arrows. A correspondent of *The Daily Chronicle*, however, says, ' the most mysterious is a baton which some experts consider may be the ceremonial wand of a cave magician. It was used, perhaps, to wave a spell over the wild deer when the cave men set out to hunt it '; and perhaps not ! In the same article, Sir Arthur Keith is accredited with saying that some fragments of human skulls submitted to him ' are of a period of about 12,000 years ago.' It would be interesting, even in the Daily Press, to have just a little evidence of some of these wild statements.

On the same day another newspaper informs us that a ' link with life on the earth 600,000,000 years ago has been revealed by Professor Sir Edgeworth David, who has found fossils of animal life in Australia older than hitherto discovered. Almost by accident, Sir E. David discovered in the rocks of Mount Lofty and in the Flinders ranges of South Austrlaia beautifully coloured fossils which, from the strata in which they were found, show that a marine fauna, in the early days of the earth's evolution, had covered a million square miles of what is now Australia.' But what possible evidence of the date ? On the following day the press announced that a mammoth had been discovered which is considered to be 20,000 years old.

We also learn from the daily press that archæologists are speculating over the origin of the so-called ' Druidical remains ' recently excavated at Southgate, within a few yards of the famous Mitchenden Oak. The ' remains ' include two large caves, with huge boulders, what appears to be an altar, with sacrificial stone, and an immense pillar of rock, on which are rude representations of serpents. In regard to the discovery Mr. F. H. Postans writes : ' I fancy that the building contractors (who discovered the remains) will find that the stones simply represent an artificial wishing well or grotto, which was constructed during the occupancy either of the Walker family or their predecessors. I fear that the romantic theory of Druidism will not stand investigation. The Mitchenden Oak, although an ancient tree, does not go back to pre-Roman times. It was planted by the Duke of Chandos.'

——: o :——

In *The Australian Museum Magazine* for July-September, edited by Dr. C. Anderson, E. Le G. Troughton has an illustrated article on ' Sea Cows : The Story of the Dugong.'

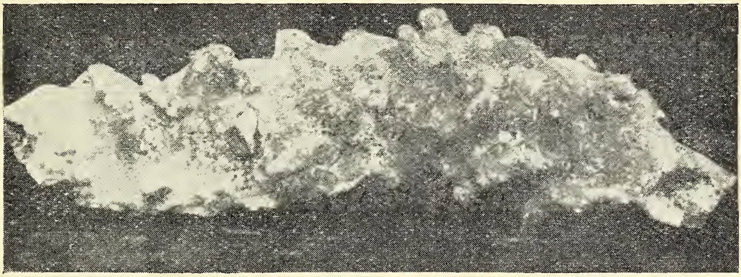
The Report of the National Trust for Places of Historic Interest or Natural Beauty for 1927-8 (7 Buckingham Palace Gardens, London, S.W.1, 138 pp.), has been received, and is a record of the wonderful achievements of the Trust in preserving our beauty spots.

We have received the August number of *The Journal of the Commons and Footpaths Preservation Society*, which contains notes on ' The Use of Commons as Recreation Grounds,' by L. W. Chubb ; ' Notes on Recent Legal Decisions,' by R. A. Glen ; ' An American Poet on the Commons of England ' ; ' Surrey Commons and the War Office ' ; and ' The Devil's Dyke, Brighton.'

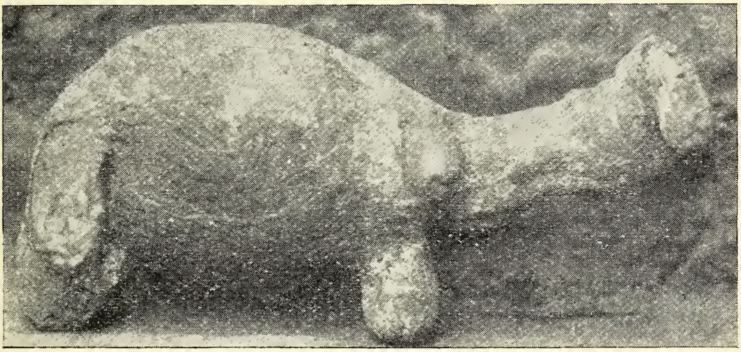
While probably nobody but the compiler has read *Index Animalium*, or ever will, as a work of reference it will undoubtedly remain of value to zoologists for all time. To peruse the sixteenth part just to hand, gives many interesting results. For example, ' morio ' has been used as a specific name by no fewer than 200 different naturalists between the years 1801-1850, whereas such words as ' minimus ' and ' minuta ' have been similarly used to an even greater extent.

FIELD NOTES.

Fossil Sponges in Yorkshire Chalk.—Two fossil sponges have recently been brought to the Hull Museum from the chalk quarry at Middleton-on-the-Wolds. They are in the familiar 'iron-rust' form, and one was likened to a dinosaur and the other to a 'hairy caterpillar.' The former is in the form of an animal with a long neck, a beak, four legs and tail, covered with fur! The other, as will be seen from the photograph, is an object covered with spines. It was clear that, notwithstanding their somewhat unusual shape, the objects were fossil sponges, a fine series of which the Hull Museum already possesses. Difficulty in naming these specimens nowadays prompted us to submit them to Dr. W. D. Lang, Keeper of the Geological Department of the British Museum (Natural History), who informs us that the 'caterpillar' appears to be *Stachyspongia spica* Roemer, which is rare, and the 'dinosaur,' *Thamnospongia clavellata* Benett. The latter is wonderfully life-like!—T. SHEPPARD.

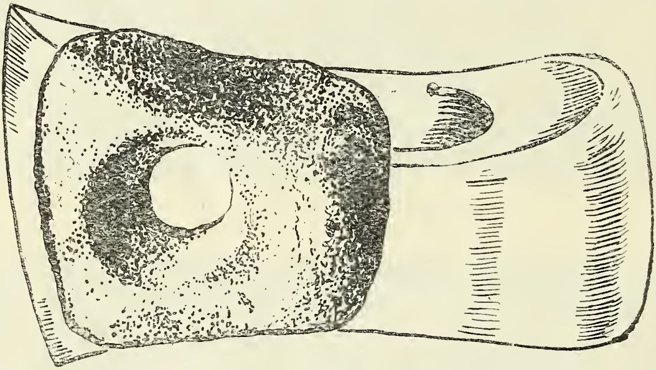


Stachyspongia spica **Roemer.**



Thamnospongia clavellata **Bennett.**

A Re-made Perforated Stone Hammer from Yorkshire.—A hand-made perforated stone has recently been found at Thornton Dale and sent to the Hull Museum. Originally it was a portion of a large hammer-head of basalt of a type met with in East Yorkshire, and on the hammer being broken at the hole for the shaft, the half of it has been re-perforated and made into a small hammer, the original cutting edge being quite blunted by constant use. There is trace of the groove forming part of the original hole for the shaft at the thick end of the implement. The specimen is triangular, and the hole for the new shaft has been made by boring from the original face of the hammer to the centre, the hole being funnel-shaped on each side. The extreme width of the hole is 1¼ inches and the width in the centre ½ inch. The weight of the implement is 5 oz. The accompanying sketch (for which we are indebted to *The Yorkshire Weekly Post*) explains the relation of this particular specimen to the original axe-head of which it once formed part.—T. Sheppard.



Platyarthrus hoffmanseggii Brandt. in V.C.63.—Mr. Brown's note is probably the first printed record of this species, but I have known of its occurrence in this district for over twenty years. My first record was made soon after the purchase of Webb and Sillem's 'British Woodlice.' Quite near to my house I saw a specimen in an ants' nest. The site was used afterwards as a rubbish tip, until the level of the surrounding land was reached, when the practice was discontinued. It is now grass-grown. In other parts of the Barnsley district I have met with the species, and also on Heath Common, Wakefield. I have never found it with yellow ants.—E. G. Bayford, Barnsley.

Methoca ichneumonoides Lat. on Allerthorpe Common.—Since August, 1923, when I was fortunate enough to take the very rare male of *Methoca ichneumonoides* on mixed herbage, on Allerthorpe Common, Mr. Butterfield and I have kept a sharp watch for the female. This has now been discovered. I took a fine specimen in a rut on a sandy cart track on the Barmby Moor end of the Common on August 3rd this year. The insect was in the neighbourhood of some burrows of *Cicindela campestris*, the tiger beetle, upon which it is parasitic.—W. J. Fordham, Barmby Moor.

——: o :——

CORRESPONDENCE.

SCOTTISH BIRDS.

Dear Sir,—From the notice of the *Geographical Distribution and Status of Birds in Scotland* in the July number of *The Naturalist*, it is obvious that your reviewer has misunderstood the plan on which it is drawn up. A page is devoted to each species or sub-species, and on each page there is an identical list of counties and sub-counties (not countries). The occurrence and status of the bird is shown by the letter after the county or sub-county in which it has occurred, the other counties and sub-counties are there, with a blank after them, so that observers may enter future records for themselves and so keep the book up to date. To take the instances used by your reviewer, the Aquatic Warbler has only been recorded from one Scottish locality, namely Fair Isle, so the letter O and the reference are found against Fair Isle, the other divisions are all blank. The Icterine Warbler has occurred in Caithness, Orkney, Shetland and Fair Isle, so the letter and references are given for each of these divisions. Should either of these birds occur in, shall we say, the Outer Hebrides, the worker would, naturally, enter for himself, the letter O and the reference in the blank space after the Outer Hebrides. May we also point out that what we said in the introduction was " the status in many cases is quite insufficiently worked out,' not ' sufficiently worked out,' as appears in your review.—Yours faithfully, Leonora Jeffrey Rintoul and Evelyn V. Baxter.

In this case we cannot attach all the blame to the reviewer, as he was abroad and not able to see a proof.—Ed.

——: o :——

The Proceedings of the Leeds Philosophical and Literary Society, Part 6, of Vol. I. of which has reached us, contains a number of somewhat technical, but no less valuable papers. Those likely to interest our readers are ' The Lower Carboniferous Corals,' by R. G. S. Hudson ; ' The Maintenance of Semi-permeability in the Plant Cell during Leaching Experiments,' by F. C. Steward ; and ' Observations on the Ova and Oviposition of Certain Ephemeroptera and Plecoptera,' by E. Percival. All are well illustrated.

We have received the *Seventh Annual Report of the Secretary for Mines* for the year ended 31st December, 1927, and the Annual Report of H.M. Chief Inspector of Mines for the same period (H.M. Stationery Office, 209 pp., 5/6 net), which is a remarkably complete survey. It is divided into five parts, namely, ' The Coal Mining Industry in 1927 ' ; ' Other Mining and Quarrying Industries in 1927 ' ; ' Proceedings under Part I. of the Mines (Working Facilities and Support) Act, 1923, and Part II. of the Mining Industry Act, 1926 ' ; ' Health and Safety ' ; and ' Annual Report of H.M. Chief Inspector of Mines under the Coal Mines Act, 1911.' In addition there are several appendices containing statistical tables, lists of publications, official committees, etc.

NEWS FROM THE MAGAZINES.

C. B. Moffat writes on 'The Black Rat,' in Vol. II., No. 3, of *The Irish Naturalists' Journal.*

C. W. Greatorex describes 'The Sparrow-Hawk at Home' in *The Animal World* for August.

Her Majesty the Queen has accepted the honorary membership of the Linnean Society, this making the honorary membership of that Society up to two.

Sir Francis Grant Ogilvie's Presidential Address to the Museums Association, given at the Glasgow Conference, is printed in *The Museums Journal* for August.

Maurice Black has an illustrated paper on '"Washouts" in the Estaurine Series of Yorkshire,' in *The Geological Magazine* for July. The subject is not a new one.

Notes on British Paraneuroptera in 1927, by W. J. Lucas; *Neptunimyia* Felt., a gall midge genus new to Great Britain, by H. F. Barnes, etc., appear in *The Entomologist* for August.

The Avicultural Magazine for August contains 'Some Notes on a Wiltshire Aviary,' by The Viscountess Grey of Fallodon; and there is a beautifully coloured plate of Lovebirds.

The death is announced of J. H. Lofthouse, an ex-Alderman of Harrogate. At one time he took a keen interest in the meetings of the Yorkshire Naturalists' Union, which he frequently attended.

E. M. Nicholson writes on 'Bird-counting from the Train,' and F. J. North on 'Wireless in Mineral Prospecting,' in *Discovery* for August. 'Is Jesus the Christ?' may also be found in the same publication.

The Report of the Corporation Museums and Art Gallery of Stoke-on-Trent for 1927-8 has been received and contains illustrations of the more important art additions. There is a page of additions under the head of natural history and archæology.

From Mr. T. Petch we have received three contributions to Mycological Science. These deal with 'Notes on Cryptocoryne'; 'A Note on Amu (*Paspalum scrobiculatum* L.)'; and 'Some Problems for the Tea Research Institute.' Mr. Petch is now the Director of the Tea Research Institute in Ceylon, and the Government of Ceylon is publishing some of his researches.

Well-illustrated accounts of the results of recent botanical research appear in *The New Phytologist* for August. Among them are 'The Root as an Absorbing Organ,' by Lorna I. Scott and J. H. Priestley; 'Illustrations of Carpel Polymorphism,' by Edith R. Saunders; and 'Note on the Presence of Mycorrhiza in the Roots of Salt Marsh Plants,' by Edna Mason.

Dr. V. G. L. van Someren and his colleagues are to be congratulated upon the continued appearance of the increasingly valuable and well illustrated *Journal of the East Africa and Uganda Natural History Society,* 'No. 31 and 32' being just to hand. The Society deserves every encouragement in its work. In the number which is to hand, containing over 70 pages and a number of plates, some coloured, 'The Butterflies of Kenya and Uganda' are dealt with.

Nature, for July 28th, in referring to *The Annual Report of the Yorkshire Philosophical Society,* 'now in its 160th year' (? 106th year), states: 'A Million Shilling Fund has been opened with the view of enlarging the Museum and replacing old cases by modern bronze ones. In view of the expense likely to be involved in such a replacement, the Council may be interested to know that there seems to be a tendency in some of the large museums to revert to well-designed wooden casing.'

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YORKSHIRE NATURALISTS' UNION.

BOTANICAL SECTION—ANNUAL MEETING, OCTOBER 13th.

The Section will meet in the Botanical Department, Leeds University, at 3-30 p.m., to nominate officers and discuss the Annual Report.

After tea a series of papers will be read.

Chris. A. Cheetham, *Secretary.*

VERTEBRATE SECTION.

President of the Section : E. W. Wade, Hull.

Meetings will be held in the Library of the Leeds Philosophical Society, Park Row, Leeds, on Saturday, October 20th, 1928.

At 3-15 p.m., to consider and pass (*a*) Sectional Reports for 1928, and to elect Officers for 1929 ; (*b*) the General and Financial Reports of the Yorkshire Wild Birds and Eggs Protection Acts' Committee for 1928, and to recommend this Committee for 1929 ; (*c*) the Report of the Yorkshire Mammals, Amphibians Reptiles and Fishes Committee for 1928, and to recommend this Committee for 1929.

At 6-30 p.m. the following illustrated papers will be given :—

- 'The Increase of the Alpine Hare on the Pennines,' by F. J. Stubbs.
- 'Short Notes on the Birds of a Dutch Marsh,' by R. Chislett, M.B.O.U., F.R.P.S.
- 'Notes on some Birds of the Norfolk Broads,' by Ian M. Thomson, L.D.S., A.R.P.S.

Members or Associates are invited to attend and bring notes, specimens and lantern slides. Will Officials of Affiliated Societies kindly notify their members?

E. Wilfred Taylor, *Hon. Sec.*
10 Telford Terrace, York.

ENTOMOLOGICAL SECTION.

The Annual Meeting of this Section will be held on Saturday, October 27th, at 3 p.m. and 6 p.m., in the Library of the Leeds City Museum. Members and visitors are requested to bring exhibits and papers.

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NOTES AND COMMENTS.

BRITISH ASSOCIATION.

The Glasgow meeting of the British Association for the Advancement of Science may be included among the successes of recent years. All through there seemed to be a spirit of friendship, and it was pleasing to greet many local scientific workers who took part in the Glasgow meeting of twenty-seven years previously. A great advantage was the housing of the various sections and committees under one roof, namely the University, which made it possible to meet more of one's friends in the reception room than otherwise would have been the case. The trams enabled the members to reach the University with ease. The social side of the meeting was catered for by receptions in the Municipal Museum, the Kelvingrove Art Gallery, etc. There were also numerous garden parties, and many semi-private and private gatherings. The various clubs, including those devoted to golf, gave the members hospitality, and very pleasant general excursions, and also others for the different sections had been planned. Long distance railway trips, probably arranged by the railway companies rather than by the Local Committee, were not very well patronized. Over 3,000 members joined for the meeting.

HANDBOOK.

Those who remember the meeting at Glasgow previously will recollect the three large handbooks which were then available, representing various subjects likely to be of interest to the visitors. Some of them were principally lists of the local fauna and flora, and, as such, probably now are as nearly up-to-date as they were then. For the present meeting the preparation of a Handbook had been placed in the hands of Professor J. Graham Kerr, J.P., F.R.S., who has brought together a very readable and well illustrated description of the city of Glasgow, its cathedral, university, colleges, galleries, commerce, geology, fauna, flora, etc. With the handbook, topographical and geological maps were presented, as well as the official guide issued by the Corporation Tramway Department, and a folder containing the handbooks to the various excursions, 18 in all. There is no doubt that this side of the activities of the Association was well catered for by the Local Committee.

'ADVANCEMENT OF SCIENCE.'

As usual under this title the various Presidential Addresses were bound together and sold at 6/-. These addresses include 'Craftsmanship and Science,' by Prof. Sir William Bragg; 'The Volta Effect,' by Prof. A. W. Porteri; 'Phosphorescence, Fluorescence, and Chemical Reaction,' by Prof. E. C. C. Baly; 'The Palæozoic Mountain Systems of Europe and America,' by E. B. Bailey ; 'The Origin and Evolution of Larval Forms,' by Prof. Walter Garstang ; 'Ancient Geography in Modern Education,' by Prof. J. L. Myres ; 'Increasing Returns and Economic Progress,' by Prof. A. A. Young ; 'The Influence of Engineering on Civilization,' by Sir William Ellis ; 'The Archæology of Scotland,' by Sir George Macdonald ; 'The Relation of Physiology to other Sciences,' by Prof. C. Lovatt Evans ; 'The Nature of Skill,' by Prof. T. H. Pear ; 'Sex and Nutrition in the Fungi,' by Prof. Dame Helen Gwynne-Vaughan ; 'Education : the Next Step,' by Dr. Cyril Norwood ; and 'The Live Stock Industry and its Development,' by Dr. J. S. Gordon.

THE JOURNAL.

In addition, *The Journal of Scientific Transactions*, containing 100 pages, had details of the various papers and discussions, and summaries of many of them. There was also the Daily Time Table and a Local Programme and Excursion Handbook. The literature was certainly voluminous, so much so that we saw more than one person 'bundle' the publications together and post them home !

BIOLOGY OF BRITISH FRESH WATERS.

In a joint discussion between Sections D and K, Prof. F. E. Fritsch stated : In spite of the large area of fresh waters in the British Isles, very few investigations of their biology are being undertaken. Of our many streams and of the big stretches of the Broads very little is known in this respect. During the early years of this century the Wests had laid the foundations for a detailed study of British lakes, but this work, though it has proved to be fundamental, has not been pursued to an extent at all comparable with the promising nature of the initial results. In fact, many aspects of limnology are altogether neglected in this country, and this applies even to the phytoplankton, which has received most attention. On the other hand, on the Continent and in the United States of America, a host of workers are dealing with the more or less self-contained biotic systems that are constituted by lakes.

LAKE TYPES.

A number of lake-types (oligotrophic, eutrophic, dystrophic), characterised by their fauna and flora and the general physical conditions, have been distinguished, and these are evidently represented also in Great Britain, where a study of the transitional types seems likely to be of special interest. Fresh-water habitats in part present analogous problems to those encountered in the sea, and a more intensive investigation of British fresh waters will no doubt help in the solution of problems of marine biology. There is also a possible economic bearing in relation to fresh-water fisheries. Great Britain lacks a fresh-water biological station, comparable to that of Plön in Germany and Linz in Austria, but, in order to initiate and stimulate limnological investigations, such a station has become an urgent necessity. Opinions will differ as to the most suitable site and the source of the necessary funds, but there will be general agreement that such a station is wanted.

BRACKEN AND HEATHER MOORLAND.

Dr. W. G. Smith reported that : These may be regarded as a heritage of former forest, the bracken replacing parts of deciduous woods, the heather, etc., representing pine forest. The forest was dominated by trees, but on their removal sub-dominant species, in the absence of shale, may become stronger and with a wider distribution. Two types of bracken may be recognised : (*a*) dense tall bracken that allows few plants below its shade ; (*b*) open bracken, where an undergrowth of grasses, heather, etc., can survive. Bracken indicates the deeper soils, and tends to follow the distribution of springs and seeps where ground water emerges to the surface. Depth of soil is necessary to protect the rhizomes from frost, etc. On soils wet all winter and spring, with some clay and deficient aeration, bracken is replaced by rushes and sedges. The other extreme soil-dryness, also limits its range. This is seen on shallow soils over rock, or where the grass turf is thick, and where bracken on the deeper soils of slopes gives place to heather or blaeberry on the flatter tops. A single bracken plant may cover many square yards, and consists of deeper rhizomes (down to 2 ft.) with few buds. The fronds arise from thinner superficial branches that grow up towards the surface.

ERADICATION.

Eradication. Annual cutting of fronds leads to depletion of reserve food-supply of the deeper rhizomes. Experiments (the Edinburgh College of Agriculture) indicate that the better results are obtained by : (*a*) one cutting about July 1st (fronds about nine weeks old) ; (*b*) an early cutting of young fronds, about four weeks, followed by another at nine weeks. One early cutting only removes the earlier unfolded fronds, and is followed by a strong crop of later fronds, sufficient to build up food supplies for the future. The crop of the first year after cutting shows little effect, but considerable reduction may be expected in the second and third years. The thicker rhizomes become shrunk and considerable lengths die, hence a single large plant becomes broken up into detached clumps, which, being nearer the surface, should be more exposed to treatment. After three years' cutting numerous buds are still present, though small and starved, hence the possibility of bracken re-establishing itself. Sprays, iron sulphate, etc., may kill the present crop of fronds, but no substance has been proved to reach the deeper rhizomes. Dry dressing with sodium chlorate, recently tested, killed the fronds, but no results are yet available as to effect on deeper rhizomes. Sheep may be induced to nibble and trample young unfolding fronds by a dressing of ground rock salt in May.

HEATHER MOORLAND.

The heather plant association may occur on three types of soil: (*a*) Ling (*Calluna vulgaris*) favours a humus soil, the humus being derived from former forest, or from decay of ling. If burned at short intervals, return is rapid both from seedlings and root stocks, and growth is strong. (*b*) Scroggy heather, of ling frequently with purple bell-heath, follows harder soils with less depth and moisture. The ling remains short, and frequently the return after burning is slow. (*c*) Peat heather occurs on drained parts of true deep peat deposits, frequently with pink bell-heath and blaeberry. Return is rapid after burning. The displacement of heather by moor mat-grass (*Nardus*) and blow-grass (*Molinia*) is a serious menace to forestry, grazing and game. Both grasses are extending at expense of heather. This is due in part to intensive grazing by sheep, which eat out the heather. Defective burning when heather is too old leads to slow return, but the grasses are little affected, reappear in a few weeks, and continue to spread before the heather is strong enough to suppress them.

PSYCHO-NEUROSES AND FAMILIES.

Dr. R. D. Gillespie, in ‘ The Relation of Size of Family to Psycho-neuroses,’ stated : It has been shown by Havelock Ellis in his ‘ Genetic Study of British Genius,’ that the eldest and the youngest members of a family are more apt than the intermediate members to be intellectually distinguished ; on the other hand, pronounced mental defect, *i.e.*, imbecility and idiocy, also effects the eldest (Still) and the youngest (Sir A. Mitchell) more frequently. Similarly, a group of psychoneurotics (persons suffering from ‘ functional mental disorders ’) has been found to be composed of a disproportionately large number of eldest and youngest members of families, after correction for discrepancies in the numbers falling into each position in the family. Only children were not exceptionally numerous among them, contrary to the general belief, being only 5 per cent. of the group. This coincides with the result of Stuart’s investigation into the temperament and character of only children among college students. The psychoneurotic persons in question frequently came from unusually large families, and the average size of family from which they sprang was five ; while individuals of the group who had married and had reached the age of forty, had families of an average size of only 1·6. The latter figure is about the average size of family in the upper and middle classes of the population as a whole at the present day, for marriages which have existed for ten years ; which suggests that psychoneurotic persons as a class are tending to infertility, but not to an extent greater than the general population of the same social strata.

FACTORS AFFECTING CELL GROWTH.

To the Botanical Section Prof. J. H. Priestley read a paper on the above subject in which he stated that : In the flowering plant, growth, as represented by increase in cell size and subsequent cell division, takes place in very different ways in different regions of the plant. Two main types of cell multiplication can be distinguished, one characteristic of the apical meristem, the other characteristic of the region of shoot or root just behind the apical meristem. These two types of cell growth are defined and the internal factors contributing to their maintenance discussed. In the intercalary meristems, vascular cambium and cork phellogen, both types of cell growth are characteristic of Monocotyledon and Dicotyledon, and in the vascular cambium ray intiials and fusiform initials show different characteristics. The organisation of growth in the shoot is considerably elucidated by a clear recognition of these different types of cell growth. Vascular differentiation, in relation to cell growth, supplies the key to the ' articulate ' development which is its characteristic feature.

THE ABSORPTION OF METHYLENE BLUE AND ORANGE G. BY PLANT TISSUE IN RELATION TO THE H. ION CONCENTRATION.

Under this title Dr. W. H. Pearsall reported that : Absorption of an acid and a basic dye by potato tissue varies with the H ion concentration. In the region of *p*H 6·5 the basic dye (methylene blue) is strongly absorbed and the acid dye (Orange G) is very weakly absorbed. About *p*H 3·0 the basic dye absorption is greatly reduced and acid dye absorption greatly increased. The increase in acid dye absorption is constantly about 1·5 times greater than the reduction in basic dye absorption. Since these variations in dye absorption are shown both by living and by dead (etherised) tissue, it is assumed that they are due to combination of the dyes with substances having ampholytic properties. Analysis shows that these substances would be iso-electric about *p*H 4·2-4·5, a figure reasonably near to the iso-electric point (*p*H 4·3-4·4) of the principal potato protein.

CANADIAN AND BRITISH PEAT.

Prof. F. J. Lewis, on 'A Comparison of the Vegetation of Peat Areas in North-west Canada and Britain,' stated: In all the cases so far investigated in Central Alberta, deposits of peat only occur in basins formerly occupied by lakes. The feature of hill peat so common in the British Isles is absent. In Alberta all the stages from free floating vegetation in the lakes, marginal successions, *Ledum* moor, young bog forest to the climax bog forest (dominated by *Picea mariana*) can be seen. The latter appear to be the stable form of vegetation, the *Sphagnum* of earlier stages being replaced by *Hypnum* and *Hylocomium*; very little peat is formed and the dense canopy of trees protects the peat from desiccation in dry seasons and from denudation by rain and wind. In Britain the hill and valley peat does not attain to a stage dominated by tree vegetation, and after the earlier stages of *Sphagnum* dominance the vegetation passes to a slow peat-forming type, which, owing to the absence of tree cover, remains vulnerable to denudation by extreme atmospheric agencies. The *Calluna* moor corresponds in type to the *Ledum* moor. The latest stage in closed vegetation in the British areas appears to be *Scirpus* moor. This becomes denuded until the whole of the peat series may be removed, when a type of vegetation dominated by *Nardus* and *Molinia* may be initiated on the glacial drift. It appears that owing to the absence of tree cover and the action of denudation, the British peat series does not attain to a stable climax type, but in the natural course of development is entirely cleared away and is succeeded by a stable type of *Nardus* or *Molinia* association.

POST GLACIAL FORESTS.

Mr. T. W. Woodhead read a paper on 'The Forests of Europe and their Development in early Post-Glacial Times.' He said: Our knowledge of the development of forest vegetation in post-glacial times has been considerably extended in recent years as the result of researches in many branches of science, especially by Swedish investigators. De Geer, by a study of the stages of retreat of the ice in the Stockholm region, and of the beautifully laminated clays laid down in a post-glacial fjord, established a geochronology which places the last Ice Age about 11,000 years ago. A. G. Nathorst, G. Andersson, A. Blytt and R. Sernander have studied the succession of the floras in the post-glacial beds of Sweden, and the two latter have suggested the following climatic periods: Arctic; sub-Arctic; boreal; Atlantic; sub-boreal and sub-Atlantic. Studies by Brögger, De Geer and Munthe indicated post-glacial oscillations in the Baltic during which characteristic shells were embedded in the littoral deposits, and the dominant ones suggested names for the three successive stages and periods, viz.: the Yoldia period, climate Arctic, culminating in a birch period ; the Ancylus period, climate warm, dry, continental, a fir period; and the Littorina period, climate warm, damp, oceanic, oak period.

PEAT POLLEN.

Another line of research is that initiated by G. Langerheim and further extended by von Post, G. Erdtman and others. This consists of a statistical study of the tree pollen grains found in peat, and the results are expressed in diagrams which show the depth of the peat in metres ; the frequency of the pollen grains found at different species being indicated by signs. By this method pollen analyses have been made of the microfossils in peat deposits over a wide area in N.W. Europe by Erdtman and others, and many typical areas in the British Isles have thus been investigated. Attention has also been directed to archæological remains, carefully excavated at the several levels in and below the peat, and these often provide a useful means of dating the plant remains. Researches in Britain by Clement Reid and others showed that the interglacial flora was much the same as the present one, and recently Wladyslaw Szafer has obtained similar results for Middle Europe from investigations of deposits in six localities in Poland. Here changes were indicated, both in climate and vegetation ; which were closely similar to those enumerated by Swedish investigators for Scandinavia in post-glacial times.

PEAT AND PALÆOLITHIC MAN.

Peat investigations by the pollen statistics method produce results which fall into line with the above and indicate the following changes in climate and succession in vegetation :—Arctic : On ground bared by the receding ice, a tundra flora, including many species common on our present moorlands. The first trees to appear were a species of *Salix* and *Betula*. Remains of Palæolithic man. Sub-Arctic : Birch-heath forest becoming invaded by pines from the more southern coniferous belt, remains of both often occur together. In Switzerland and Middle Europe occur *Pinus montana*, *P. cembra*, *Larix* and further north *Picea*. Remains of late Palæolithic and Epi-Palæolithic man. Boreal : Climate warm, dry, continental. The coniferous forests, with mountain ash and bird cherry, were invaded by elm and oak, which marked the beginning of degeneration of the pine forests. Erdtman contends that hazel was an early and important pioneer in the development of the deciduous forest and suggests that immigration in Britain, from the south-east, was in the following order: *Salix, Betula, Pinus, Corylus, Ulmus, Quercus, Alnus.*

RELICS OF AN ARCTIC FLORA.

During boreal time the deciduous lake and swamp areas and enclosing relics of the Arctic flora. Towards the end of boreal time, and early in the succeeding period the land connexion of the British Isles with the continent was severed and coincident with this a change of climate. In these deposits are Neolithic remains. Atlantic: Climate warm, moist, oceanic. Peat period. This change of climate provided conditions for extensive peat formation throughout N.W. Europe, including the British Isles, and had a profound effect on the forest vegetation. Peat developed over extensive upland as well as lowland areas, and, invading the forest, eventually destroyed and buried its remains. On the drier, calcareous, and better drained areas unfavourable for peat formation, *e.g.* areas occupied by beech forest, no remans were preserved, and their history is in consequence very incomplete. Thus our present forests are largely relics of this boreal period. Sub-boreal: Climate warm, dry, continental. A brief recurrence of pine in many parts of northern Europe on drying surface of peat. Late Neolithic and Bronze Age remains. Sub-Atlantic: Climate moist and cold. Renewed peat formation in which are Romano-British remains.

MAN AND EUROPEAN FOREST.

Dr. M. I. Newbiggin gave a paper which began by pointing out: (1) that the greater part of the surface of Europe is climatically suited for tree-growth, and was tree-clad till man interfered; (2) that, as compared with similar latitudes in North America and Asia, the number of indigenous, forest-forming tree species is small; (3) that the surface was very largely denuded by man of its original forest cover before timber entered largely into world commerce, that is, before the industrial period; (4) that reafforestation has been practised on a considerable scale in parts—but in parts only—of the Continent, and that the reconstituted woodlands differ as a rule both in composition and in character from the original forests. These facts are then considered in relation to the land-forms and relief of Europe with the object of showing the ways in which these influenced both the original characters and distribution of the forests, and man's attitude towards them, alike in its destructive and conservative aspects.

CONFERENCE OF DELEGATES.

At the first session the President of the Conference of Delegates, Dr. Vaughan Cornish, opened a discussion on 'The Preservation of Scenic Beauty and Natural Beauty.'

He dealt with the subject under the heads of (1) Great Britain's heritage of scenic beauty, (2) Scenic harmonies of the town, (3) Scenic beauties of suburbs and seaside resorts, (4) Scenic harmonies of farm and village, (5) The needful background of wild nature, (6) Education in scenery and the necessity of measures for protecting scenery. After the address the following resolution was proposed by Dr. C. R. Gibson, seconded by Mr. T. Sheppard, supported by Miss R. M. Fleming, the Earl of Crawford and Balcarres, Sir John Stirling Maxwell, Prof. F. Bailey, Mr. J. W. Jackson, Dr. F. Davidson, Dr. Hamshaw Thomas, and Miss Constance Cochrane, and carried unanimously. (Referred to Council by the General Committee, among other resolutions, for consideration, and, if desirable, for action):—'That it appears desirable that the British Association for the Advancement of Science should urge upon His Majesty's Government to stimulate the employment by local authorities of the powers already conferred upon them by Parliament for the preservation of scenic amenity in town and country.'

YORKSHIRE NATURALISTS AND PRESERVATION.

Mr. Sheppard (Vice-Chairman of the Corresponding Societies Committee) said that in his dual capacity as the representative of the Yorkshire Naturalists' Union, and of the Museums Association, he was proud to have the opportunity of thanking Dr. Vaughan Cornish for his interesting address. Both the societies he represented had the scheme voiced by Dr. Cornish well at heart. The Yorkshire Naturalists' Union, one of the oldest of its kind in the country, with about 4,000 members and associates, had for many years taken an active part in the preservation of natural monuments and of the fauna and flora of the county. Many of its members privately subscribed to a fund to pay watchers to look after the rare birds nesting on the Spurn Peninsula, at Hornsea Mere, the Bempton Cliffs, and in the dales bordering the Lake District. In these areas many exceedingly rare species were still, thanks to the Union, able to exist and bring forth their young. In addition to its members, there were about forty affiliated natural history and scientific societies in the county, each of which took an active part in endeavouring to preserve the natural features, to prevent the extermination of rare plants and animals, in looking after the commons, footpaths, and so on. The Union's journal, *The Naturalist*, had also assisted. The encroachment of buildings on natural features was discouraged.

THE MUSEUMS ASSOCIATION.

The Museums Association consisted of representatives from the various National and Provincial Museums in Great

Britain, and the directors of the museums and committees had largely contributed towards the end suggested. To-day an enormous number of valuable and historic buildings and parks were preserved for the benefit of the public for all time by corporations and private bodies, who had turned them into museums and open spaces of one description or another. In some instances the buildings were preserved for their purely architectural features, in others for their associations with important people who were connected with them. It was impossible to enumerate them all or refer to the great number of places which were under the control of museum authorities, but one might mention two or three which came to one's mind, merely as types. 'In Yorkshire,' Mr. Sheppard continued, 'we have the Bolling Hall at Bradford, Wilberforce Museum at Hull, the Brontë Museum at Haworth, the Folklore Museum in the Tithe Barn at Easington, and others. There are also the Hall'ith-Wood Museum at Bolton, Strangers' Hall at Norwich, and innumerable others, which contain objects connected with the lives of the people formerly associated with the building, the latest acquisition of course being Darwin's house at Down. In many cases land, timber, and other features are also preserved. Particulars of other similar museums in the country will be found in the report of the Public Museums of the British Islands to the Carnegie Trustees by Sir Henry Miers, recently issued. He gave these as examples of the way in which corporations and private individuals could assist in carrying out the work suggested by the Chairman.

THE LAKE DISTRICT.

At the second meeting of the Conference, Dr. Cornish dealt with Wordsworth and the Lake District, Dr. H. R. Mill gave a brilliant address on the geography of the Lake District, Dr. Herefort, of Oxford, gave a somewhat lengthy paper on Wordsworth's interpretation of Nature, after which Mr. Ewart James read a paper on 'Regional Planning for the English Lake District.' This last and exceedingly valuable contribution, unfortunately, was heard by only a very few delegates, the length of the previous proceedings having exhausted the patience of most.

WORDSWORTH'S 'DESCRIPTION.'

In his address, Dr. Vaughan Cornish hailed Wordsworth as a pioneer in the science of scenery, and quoted the following from the poet's 'description' written after the Lake District began to be accessible by railway, and new people came to live there: 'It is, then, much to be wished that a better taste should prevail among these new proprietors, and, as they cannot expect to leave things to themselves, that skill and knowledge should prevent unnecessary deviation from that path of simplicity and beauty, along which, without design and unconsciously, their humble predecessors have moved. In this wish the author will be joined by persons of pure taste throughout the whole island, who by their visits, often repeated, to the lakes of the North of England, testify that they deem the district a sort of national property, in which every man has a right and interest, who has an eye to perceive and a heart to enjoy.'

2,000,000 WORD CONFERENCE.

We learn from *The Eastern Morning News* that : 'The British Association meeting in Glasgow has been a conference of something like 2,000,000 words. The 3,000 members have sat in 13 different sections, and listened to 275 papers, each of which probably contained on the average between 3,000 and 4,000 words. In addition, there have been innumerable discussions which must have provided another 1,000,000 words. Yet even this did not satisfy the scientific enthusiasm of the Association's "grand old man," Sir Oliver Lodge, who complained, in an interview, that the conference had suffered from the tyranny of the time-table, and that in Lord Kelvin's time, if they wanted to discuss a subject for an hour, they did, and the time-table had to wait.'

PAPERS AND ADDRESSES.

The variety of subjects discussed at Glasgow may be indicated by the following titles of 'The Mechanism of Thunderstorms' ; 'Experiments on Supraconductors' ; 'The Deferred Approach to the Limit' ; 'The Conus arteriosus of Fishes' ; 'Parthogenetic Male and Female Production by two kinds of Females in one and the same Species of Sawfly' ; "Leucocytes and Fibroblasts cultivated in vitro' ; 'The Pegididæ, a New Family of Foraminifera linking up the Globigerinidæ and the Rotalidæ' ; 'Habits of Certain Social Caterpillars' ; 'Embryology of Sponges' ; 'The Tail of Lepidosiren' ; 'An Investigation into the Throat Conditions during the Adiabatic Flow of Mercury Vapour through Nozzles, within a Unique Range of Initial Superheats' ; 'Egyptian God of Death' ; 'Educability' ; 'Errors in Spelling' ; 'Hypnotism' ; 'Meaning and Error' ; 'Heterothallism in *Humaria granulata*' ; 'Chromosomes in Caryophyllaceæ' ; 'Division in Stypocaulon and Cladophora' ; 'Sexuality in the Ectocarpaceæ' ; 'Genetics of a Tropeolum mutant,' and so on. No wonder the president stated that, on visiting a certain section with some of the officers, he came to the conclusion that the subject for discussion related to insects, his coleagues opined that it was a species of fish ; actually it was an Oriental language !

LEEDS PHILOSOPHERS.

The Proceedings of the Leeds Philosophical and Literary Society, Vol. I., Part VII., recently received, contains three papers of particular interest to our readers, namely, ' Potassium Thiocyanate and the Diastatic Action of Saliva and Plant-Diastases,' by L. R. Johnson and A. Wormall ; ' On the Asymmetry and Closure of the Endostyle in *Cyclosalpa pinnata*,' by W. Garstang ; and ' On the Lower Carboniferous Corals : *Hettonia fallax*, gen. et sp.n.,' by R. G. S. Hudson and F. W. Anderson. There are also other memoirs, including one on ' The Possibility of Ring-chain Valency Tautomerism, and of a Type of Mobile-Hydrogen Tautomerism analogous to the Wagner-Meerwein Rearrangement. Part V.—Pinacolic Electron Displacement as an Explanation of Various Intra-molecular Transformations,' by C. W. Shoppee.

SLIGO ' ARTIFACTS.'

Under the above heading, R. A. S. Macalister, in *Man* for September, shows how articles sent to scientific journals are dealt with. In the course of his report he states that : ' We might admit the possibility of their being artifacts of a later date. This, however, would not serve the contentions of Messrs. Moir and Burchell, who claim to have found *Palæoliths*, not merely artifacts in general. But, though I yield to none in respect for the name and the authority of M. Breuil, I find it easier to believe that these amorphous objects have been formed by some natural force, and that criteria of human handiwork pointing to an opposite conclusion are illusory, than that any community, of a stage of civilisation later than Palæolithic, fashioned them artificially, in the expectation that they would serve any purpose whatsoever.'

PEBBLES ON THE BEACH.

' When I handed a stone to Mr. Burchell, as described in the " flyleaf " letter, I made some such remark as " That is just as good as anything you have published." This opinion I still hold, and now repeat. I do not believe that the Sligo " artifacts " are artificial ; I do not believe that my stone is artificial : and 0=0. This opinion is irrespective of the nature of the fractures on the stones, an irrelevant matter on which I committed myself to no opinion. I wanted nothing more than a tangible expression of my inability to treat the Sligo objects seriously, and this stone happened to come to hand. Almost any other stone on the beach would have served my purpose equally well. Therefore, when Messrs. Moir and Burchell lay stress upon the contrast between their specimens and mine in this respect, they are merely beating the air.'

THE FOSSIL AND ITS ENVIRONMENT.

Dr. F. A. Bather, F.R.S., favours us with a copy of his Presidential Address to the Geological Society of London, with the above title. He states that 'Comparing the palæontology of to-day with that of forty years ago when I entered the ranks of professional palæontologists, I see a great change. The change is that which has affected biology as a whole, and indeed is paralleled in other branches of science. Nearly every science has to pass through a descriptive, purely observational stage before it can proceed to consider relations and causes: Madam How always takes precedence of Lady Why. So also one is forced to study things in their static aspect before one can appreciate the dynamic. Biology has emerged from the static morphological period of growth into the dynamic physiological period, and of Palæontology in particular we may say that the subjects of its study are regarded no longer as dead matter but as living beings.

CUVIER, SWINNERTON, MORLEY DAVIES AND HAWKINS.

'It would be absurd to press this contrast too far. The leaders of our science have always exercised their imagination on the fragmentary relics of former worlds. For Cuvier a bone because it was fossil was no less a part of an actively functioning creature, and, because of that function, enabled one to reconstruct in thought the whole machine. Many names might be mentioned with equal honour; but most of these men were anatomists of recent animals first and palæontologists afterwards, and in the field of vertebrate palæontology it is a little difficult to avoid physiological considerations. If we look back forty years at the palæontology of the invertebrates and plants, we must admit that it was nearly all mere palæontography, a most praiseworthy and necessary study, admirably exemplified in the "Paléontologie Française" and the Monographs of our Palæontographical Society. The chief interest of fossils in those days was as "Medals of Creation," dating the successive chapters of Earth history, and the chief anxiety of an examination candidate was to spot the fossils put before him by an examiner. Even examiners, we trust, have progressed since then; certainly the professors have, as the excellent books by Swinnerton, Morley Davies, and Hawkins bear witness.

ZOO-GEOLOGY AND GEO-ZOOLOGY.

'Naturally, an exact knowledge of fossils as stratigraphic counters is not to be undervalued, but fully to appreciate the light which fossils can shed on the past history of the Earth, it is necessary to study them in many aspects. Edward Forbes used to divide palæontology into Zoo-Geology and

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Geo-Zoology. It is the former division that embraces the study of animal conditions and associations as illustrating the succession of extinct forms in their relation to the strata containing them. These terms excluded the plant world, but that defect was remedied when Louis Dollo in 1904 proposed for the historical branch of the science the term Biostratigraphy, while those branches which are in closer relation with zoology and botany he grouped under the name Palæobiology.'

BOTANICAL EXCHANGE CLUB.

Dr. G. C. Druce has issued his *Report for 1927 of The Botanical Society and Exchange Club of the British Isles.* It is a wonderful compilation, and among the many papers likely to interest readers of *The Naturalist* are 'New County and other Records'; 'The Flora of St. Kilda,' by W. B. Turrill, M.Sc., F.L.S.; 'Sagine reuteri,' by W. H. Pearsall; 'British Plants contained in the Du Bois Herbarium at Oxford, 1690-1723,' by G. C. Druce; 'Some Kent and Surrey Brambles,' by Wm. Watson; 'The Distribution of Thymus in Britain,' by K. Ronniger; 'Some English Alchemillas,' by F. Jaquet; 'Experience and Opinion,' by E. Almquist; 'Plant Notes,' by Dr. Eric Drabble; 'Notes on Rosa,' by Lt.-Col. Wolley-Dod; 'Veronica anagallis L. and V. aquatica Bernh.,' by C. E. Britton; and 'Personalia and Various Notes.'

'WASHOUTS.'

In the *Geological Magazine* for July, Mr. Black figures and describes '"Washouts" in the Estuarine Series of Yorkshire.' In this he says: 'At the southern edge of the channel containing the sandstone which forms the small reef 700 yards south of Cromer Point, there is a small but sharp anticlinal fold of a superficial nature.* This fold is exactly above the place where the sandstone at the margin of the channel dies out, and actually encloses its attenuated edge. The effect of the fold does not extend downwards, and it seems fairly clear that it is due to differential movement produced by the massive wedge of sandstone amongst the shales during settling down and contraction after deposition.' This precise feature is figured and described, we believe quite correctly, as a 'Glacial Contortion near Scarborough,' in the *Transactions of the Hull Geological Society.*† Another paper, which does not seem to have been consulted by the author of the recent memoir, is on 'The Estuarine Series of the Yorkshire Coast,' by E. Hepworth, in the *Transactions*

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* Figured on the diagram.—Ed.

† Vol. IV., 1896-97, p. 5.

of the Leeds Geological Society.* In this paper particular attention is paid to the 'washouts' near Jackass Road, and three sections of the 'washouts' are figured. Those of us who spend considerable time in preparing bibliographies for the benefit of students feel that these might be consulted.

EXPENSIVE WITCHCRAFT.

In certain areas, witches, boggards and diviners are still believed in. A recent issue of the *Hull Daily Mail* gives the following: 'The Water Committee of the Brigg Urban District Council reported to the Council at the monthly meeting on Friday night that the sinking of the new bore at the St. Helen's site, Wrawby (the source of the present supply), was abortive, and had consequently been abandoned. The bore was sunk on the advice of a water diviner, who told the Council that a further supplementary supply capable of yielding 100,000 gallons per hour was available from a stream running parallel with the existing supply, and on this advice the Council pledged their faith. They employed a Grimsby firm to sink the well to a depth of 350 feet at a cost of approximately £400. Water was found at a depth of 240 feet, but as this did not yield the quantity required the bore was continued to a depth of 350 feet without finding a further supply. The Council then decided to seek the services of a diviner, but abandoned this project on the advice of a geologist, who recommended that before any further steps be taken a test should be made. It was then arranged for the contractors to make the test, and this was carried out at a cost of £72, plus £12 per day working costs. This test was abandoned after only a few days' work, as it was found practically impossible to get any water. The Council, after spending £500 over the scheme without success, have now definitely decided to abandon the scheme and make further enquiries for another site for a supply. The contractors have been asked to clear their tackle away.'

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We have received the *Twenty-second Annual Report of the Borough of Rawtenstall Museum*. The gifts for the year are one large photograph, old razor and umbrella handle, old coins, python, photographs, old paper, two cases of birds, one case of coral, one fossil, two cases of birds, old papers, one pistol, war relics, crystals, sugar cutters, one jug, two pictures, one stone christening font, collection of horns and skulls, one crystal, one case of birds, plates and slides, and one jug.

We are glad to find from its Eighth Part of the *Proceedings of the Isle of Wight Natural History and Archæological Society*, that it continues to flourish and increase in membership. There is a valuable contribution to the 'Isle of Wight and the Ancient Tin Trade,' by Sir Frederick W. Black, which concludes that the British tin trade in B.C. 330 had no connexion at all with the Island. James Groves gives the 'Story of our Spartina,' and there are notes on Fungi, Coleoptera, Birds, and many others, all of which are distinct contributions to the natural history of the Island.

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* Part XIX., 1923, pp. 24-28.

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RARE MOLLUSCS IN THE HULL MUSEUM.

HANS SCHLESCH.

In the Schlesch collection there are two further very interesting shells, which are here figured.

1. *Pupilla muscorum* L. monstr. *sinistrorsum*. Figure × 10.

This specimen was found by me in a lot from Christianshavns Vold, in Copenhagen, 1906. It is not unique, but only very few specimens of sinistral *Pupilla muscorum* L. are known.

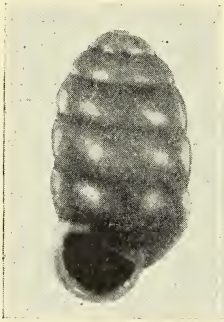

Fig. 1.

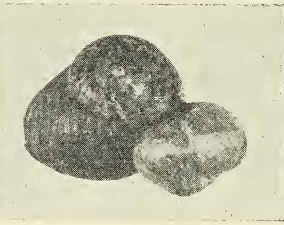

Fig. 2.

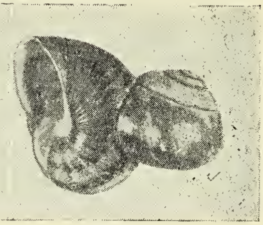

Fig. 2*a*.

2 and 2*a*. *Helix aspersa* Müll., mended by a perfect shell of *Helix nemoralis* L. Figure × $\frac{3}{4}$.

The reason the animal of *Helix aspersa* Müll., instead of mending a gap in the shell in the usual way, has fixed a dead but perfect shell of *Helix nemoralis* L. to itself and still closed the aperture of the latter, is inexplicable. This deformity is from the Depart. Seine inferieur in France, and presented to me several years ago by the late Mr. Geret in Paris.

——: o :——

Bushland Vagabonds, by **James Pollard.** London : Hodder & Stoughton, 316 pp., 7/6 net. This is a series of stories likely to interest young people, especially those who have natural history or scouting as a hobby. The stories are well written, and the book will make an excellent prize.

A Game Ranger on Safari, by **A. Blayney Percival.** London : Nisbet and Co., xv.+305 pp., 15/- net. The writer gives a refreshing account of big game and other members of the fauna of Africa. He has an intimate knowledge of the habits and distribution of all sorts of animals, his stories of the baboons, chimpanzees and monkeys, 'small deer,' crocodile, snakes and 'monsters,' being out of the usual line in books of this sort. A particularly valuable feature is the series of reproductions from photographs of big game, sometimes in herds, sometimes singly, in their natural surroundings.

YORKSHIRE BASIDIOMYCETES : GASTEROMYCETALES.

F. A. MASON, F.R.M.S.,
Recorder, Mycological Committee.

Of the 93 species of fungi belonging to this alliance of the Autobasidiomycetes listed as British by C. Rea, in ' British Basidiomyceteæ,' 1922, and his ' Appendix,'* 1927, only 46 species have been recorded in Yorkshire. The systematic account contained in Massee and Crossland's ' Fungus Flora of Yorkshire,' 1905, in which 40 species are listed, is based upon Massee's ' Monograph of the Gastromycetes,' 1889, although the arrangement made use of in the Flora differs from that of the Monograph. Although the completed volume of the Flora bears the date 1905, the part containing the fungi dealt with here was actually published in November, 1902, as Part 28 of the *Transactions of the Yorkshire Naturalists' Union*, and the notable work of L. Hollós ' Die Gasteromyceten Ungarns,' which appeared in 1904, and which might have influenced the authors in some instances of nomenclature before 1905, could not have been seen by them at the time the ' Gastromycetes ' were written up. Since that date other changes in nomenclature have been made as a result of the work of the late C. G. Lloyd, of Cincinatti, on the puffballs and allied fungi.

The present revision of the records of Yorkshire species follows the arrangement of C. Rea, and such alterations in nomenclature as are necessary are referred to in their proper sequence in the annotated list of additions which follows. The subjoined table illustrates the recorded distribution of the species in the five recognised sub-divisions of the county :

	Gen.	Spp.	N.W.	N.E.	MidW.	S.W.	S.E.
" Fungus Flora," 1905 ...	15	40	10	34	21	27	13
August, 1928 ...	16	46	12	37	22	33	18

A key to the abbreviations will be found in the writer's ' Yorkshire Phycomycetes,' *The Naturalist*, 1927, p. 268.

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* C. Rea : Appendix to ' British Basidiomyceteæ,' *Trans. Brit. Mycolog. Soc.*, XII., 1927, p. 205.

CYNOPHALLUS CANINUS (Huds.) Fr.
As *Mutinus caninus* (Huds.) Fisch., *F. Fl.*, p. 16 ; recorded for all Divisions.

PHALLUS IMPUDICUS (Linn.) Pers.
As *Ithyphallus impudicus* (Linn.) Fisch., *F. Fl.*, p. 16 ; common in all Divisions.

P. IMPUDICUS var. *TOGATUS* (Kalchbr.) Cost. et Duf.
N.E.—Beedale, Scarborough F.F., Sept., 1915 ; A. E. Peck, *Nat.*, 1916, p. 18. A photograph of this variety as ' *P. impudicus* with veil ' is reproduced *loc. cit.* It differs from the type in having a white, reticulately pendant veil, attached to the pileus. First British record.

LYCOPERDON GIGANTEUM (Batsch) Pers.
As *L. bovista* L., *F. Fl.*, p. 13 ; recorded for all Divisions.

L. CÆLATUM (Bull.) Fr.
S.E.—North Cave, 1903, F. Warnes ; *F. Fl.*, *Appendix* II., p. 373.

L. SACCATUM (Vahl.) Fr.
N.W.—Sedbergh Exc., August, 1902 ; *F. Fl.*, *App.* II., p. 373.

L. DEPRESSUM Bon.
S.W.—On the ground in woods, Farnley Tyas, F.F., Sept., 1906 ; C.C., *Nat.*, 1907, p. 40 and p. 100. First Yorkshire record. Doncaster F.F., Sept., 1914 ; *Tr. B.M.S.*, V., 1915, p. 15.
S.E.—Escrick, Selby F.F., Sept., 1918 ; *Tr. B.M.S.*, VI., 1919, p. 84.

L. CANDIDUM Pers.
S.W.—On the ground among Hazel bushes, Maltby and Stubbins Wood, Maltby F.F., Sept., 1905 ; C.C., *Nat.*, 1905, p. 338, as ' probably *L. velatum* Vitt.' ; Massee and Crosland, *Nat.*, 1906, p. 6, refer the same gathering to *L. cruciatum* Rost., with amplified description, accompanied by photographs. First Yorkshire record.

L. UMBRINUM Pers.
S.W.—Doncaster B.M.S. Foray, Sept., 1914 ; *Tr. B.M.S.*, V., 1915, p. 15. First Yorkshire record.
N.E.—Raincliffe, Scarborough, Sept., 1918 ; collected by A. E. Peck and C. Rea. Scarborough Field Naturalists' Society Records.
S.E.—Escrick, Selby F.F. and B.M.S. Foray, Sept., 1918 ; *Tr. B.M.S.*, VI., 1919, p. 84. Stamford Bridge F.F., Sept., 1927 ; A. E. Peck, *Nat.*, 1927, p. 365.

L. PERLATUM Pers.
Included under this name and redundant under the synonym, *L. gemmatum* Batsch, in *F. Fl.*, pp. 12-13. Common in all Divisions.

L. MOLLE Pers.
N.E.—Scarborough F.F., Sept., 1915 ; A. E. Peck, *Nat.*, 1916, p. 21. First Yorkshire record.

L. PYRIFORME var. *EXCIPULIFORME* Desmaz.
N.W.—On decaying Ash stump, by roadside, Jervaulx Abbey, April, 1928 ; collected by F.A.M.

L. SPADICEUM Pers.
S.W.—Farnley Tyas F.F., Sept., 1906 ; C.C., *Nat.*, 1907, p. 54, in which place the species is recorded under this name ; C.C., *Nat.*, 1907, p. 100, where the same gathering is referred to *L. Cookei* Mass. First Yorkshire record.

L. POLYMORPHUM Vitt.
N.E.—Ayton, near Scarborough, Aug., 1920 ; collected by A. E. Peck ; Scarborough Field Naturalists' Society Records. First Yorkshire record.

L. POLYMORPHUM var. *CEPÆFORME* (Bull.) Lloyd.
As *Bovista capæformis* (Bull.) Mass., *F. Fl.*, p. 14.

L. PUSILLUM (Batsch) Pers.

As *Bovista pusilla* (Fr.) De Toni, *F.Fl.*, p. 14.

BOVISTELLA PALUDOSA (Lév.) Lloyd.

N.E.—Among sphagnum on the moors near Osmotherley, Exc., Aug., 1908 ; T. Gibbs, *Nat.*, 1908, p. 457, 'only one previous gathering is known, that made by Léville at Malesherbes, France, in 1845.' A specimen was sent by Mr. Carleton Rea to the late C. G. Lloyd, Cincinatti, who published a note on the re-discovery of this puff-ball, *Mycological Notes*, No. 33, Aug., 1909. Lloyd records a third gathering from Montenegro, Feb., 1908, which had been described as a new species under the name *Lycoperdon Bubakii*. The plant is indistinguishable from *Lycoperdon polymorphum* in appearance and may only be separated from that species microscopically. First British record.

BOVISTA PLUMBEA Fr.

S.E.—Stamford Bridge, F.F., Sept., 1927 ; A. E. Peck, *Nat.*, 1927, p. 365. *Bovista ammophila* Lév., F.Fl., p. 14, is a synonym of this species, and the record for the occurrence of a puffball so named, from Cullingworth, S.W. Div., is included here in the systematic list which follows.

GEASTER MAMMOSUS Chev.

N.W.—Under a hedge, pasture side near Witton, Wensleydale, March, 1908, collected by W. A. Thwaites ; C.C., *Nat.*, 1909, p. 180. First Yorkshire record.

G. UMBILICUS Fr.

As *G. striatus* D.C., in *F.Fl.*, p. 11.

G. FIMBRIATUS Fr.

Mid.W.—Parlington Park, Selby F.F., Sept., 1918 ; *Tr. B.M.S.*, VI., 1919, p. 85. A noteworthy additional record for this Division.

G. TRIPLEX Jungh.

As *G. Michelianus* W. G. Sm., *F.Fl.*, p. 11, for N.E. and S.W. Divisions.

S.W.—An additional record of a gathering made by J. Needham, in Peckett Wood, Hebden Bridge, June, 1905, was published by C.C., *Nat.*, 1907, p. 99, as a species new to Britain. Almost simultaneously, C. G. Lloyd, in his 'Mycological Notes,' No. 25, April, 1907, pointed out the identity of the plant known in this country as *G. Michelianus* with *G. triplex*, and this synonymy is adopted by C. Rea.

G. RUFESCENS Pers.

Mid.W.—Valley of Desolation, Bolton Woods, Dec., 1920, collected by R. W. Butcher ; F.A.M., *Nat.*, 1921, p. 74. Bolton Percy, October, 1926, collected by G. W. Bramley (F.A.M.).

S.W.—On bare soil under Sycamore, Skircoat, Halifax, Oct., 1907 ; C.C., *Nat.*, 1909, p. 222.

N.E.—Mulgrave Woods, Sandsend, F.F., Sept. 1926 ; A. E. Peck, *Nat.*, 1926, p. 357.

G. RUFESCENS var. *MINOR* Pers.

Mid.W.—On bare garden soil, Roundhay, Leeds, Nov., 1923, collected by Mrs. Scott Stanley ; F.A.M., *Nat.*, 1924, p. 45, with photographs of this variety and the type from Mid.W. Div., as recorded above. First Yorkshire record.

CYATHUS OLLA (Batsch) Pers.

As *C. vernicosus* D.C. in *F.Fl.*, p. 9.

MELANOGASTER VARIEGATUS var. *BROOMIEANUS* (Berk.) Tul.

S.E.—On charred ground, Beech wood, Mount Airy, South Cave Exc., Aug., 1894 ; *F.Fl.*, App. I., p. 366.

SCLERODERMA AURANTIUM Pers.
As *S. vulgare* Fr. in *F.Fl.*, p. 14. Common in all Divisions.

S. AURANTIUM var. *LÆVIGATUM* (Fuck.) W. G. Sm.
N.E.—Castle Howard F.F., 1909; C.C., *Nat.*, 1909, p. 419, and *loc. cit.*, 1911, p. 166. First Yorkshire record.

S. VERRUCOSUM (Vaill.) Pers.
S.W.—Doncaster, B.M.S. Foray, Sept., 1914; *Tr. B.M.S.*, V., 1915, p. 15.
S.E.—Stamford Bridge F.F., Sept., 1927; A. E. Peck, *Nat.*, 1927, p. 365.

ASTRÆUS HYGROMETRICUS (Pers.) Morgan.
As *Geaster hygrometricus* Pers. in *F.Fl.*, p. 11.

TULOSTOMA BRUMALE Pers.
As *T. mammosus* Fr. in *F.Fl.*, p. 10.

SPHÆROBOLUS TERRESTRIS (A. & S.) W. G. Sm.
As *Thelebolus terrestris* (A. & S.) Tode, in *F.Fl.*, p. 10. The second species entered under Thelebolus, *loc. cit.*, *e.g.*, *T. stercoreus* Tode, has been included in the Gasteromycetes in error; it is an Ascomycete belonging to the Ascobolaceæ.

Note.—There is on record, App. I., F.Fl., p. 366, No. 2574, under the name *Lycoperdon flavosum* Oed., a fungus discovered at Hebden Bridge. This was reported by C. Crossland, *Nat.*, 1903, p. 50, as a 'well-marked puff-ball met with in Peckett Wood, in August, 1902, by J. Needham. It has been submitted to Mr. G. Massee, Kew, who states it to be as above, and a very good addition to the British Fungus Flora.' All attempts to trace this name in mycological literature have failed. Miss E. M. Wakefield informs me that nothing is known of it at Kew, and there is not a specimen in Crossland's Herbarium which is preserved there. It is stated in the Appendix, *loc. cit.*, that Bolton's Tab. 117 contains a figure much resembling this species, but until something more definite regarding its validity is known it is preferable to delete it from our lists.

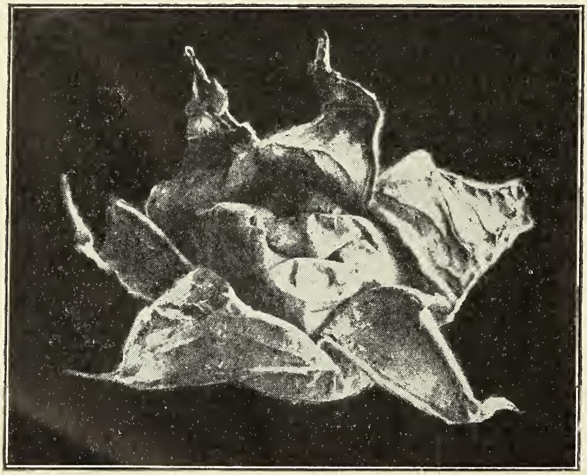

Photo by the author.

Geaster rufescens × $\frac{1}{1}$.
From Bolton Percy as recorded above.

No.	**BASIDIOMYCETES—** GASTEROMYCETALES.	N.W.	N.E.	MID W.	S.W.	S.E.
	PHALLACEÆ.					
	CYNOPHALLUS (Fr.) Corda					
1	*caninus* (Huds.) Fr.	×	×	×	×	×
	PHALLUS (Micheli) Pers.					
2	*impudicus* (Linn.) Pers.	×	×	×	×	×
	impudicus var. *togatus* (Kalchbr.) Cost. et Duf.	—	×	—	—	—
	HYMENOGASTRACEÆ.					
	HYMENOGASTER (Vitt.) Tul.					
3	*Klotzschii* Tul.	—	—	—	×	—
4	*vulgaris* Tul.	—	×	—	—	—
	RHIZOPOGON Fr.					
5	*luteolus* Fr.	—	—	—	×	—
	LYCOPERDACEÆ.					
	LYCOPERDON (Tournef.) Pers.					
6	*giganteum* (Batsch) Pers.	×	×	×	×	×
7	*cælatum* (Bull.) Fr.	—	×	×	×	×
8	*saccatum* (Vahl.) Fr.	×	×	×	×	×
9	*depressum* Bon.	—	—	—	×	×
10	*candidum* Pers.	—	—	—	×	—
11	*echinatum* Pers.	—	×	—	×	—
12	*Hoylei* Berk.	—	×	—	×	—
13	*atropurpureum* Vitt.	—	×	—	—	—
14	*umbrinum* Pers.	—	×	—	×	×
15	*perlatum* Pers.	—	×	×	×	×
16	*molle* Pers.	×	—	—	—	—
17	*pyriforme* (Schaeff.) Pers.	×	×	×	×	×
	pyriforme var. *excipuliforme* Desmaz.	×	×	—	—	—
18	*spadiceum* Pers.	—	—	—	×	—
19	*polymorphum* Vitt.	—	×	—	—	—
	polymorphum var. *cepæforme* (Bull.) Lloyd	—	—	×	—	—
20	*pusillum* (Batsch) Pers.	—	×	×	×	—
	BOVISTELLA Morgan					
21	*paludosa* (Lév.) Lloyd	—	×	—	—	—
	BOVISTA (Dill.) Morgan					
22	*nigrescens* Pers.	×	×	×	×	—
23	*plumbea* Fr.	—	×	×	×	×
	GEASTER (Micheli) Fr.					
24	*Bryantii* Berk.	—	×	—	—	—
25	*umbilicatus* Fr.	—	×	—	—	—
26	*limbatus* Fr.	—	×	—	—	—
27	*mammosus* Chev.	—	×	—	—	—
28	*fimbriatus* Fr.	—	×	×	—	—
29	*lageniformis* Vitt.	—	—	—	×	—
30	*triplex* Jungh.	—	×	—	×	—
31	*rufescens* Pers.	—	×	×	×	×
	rufescens var. *minor* Pers.	—	—	×	—	—
32	*fornicatus* (Huds.) Fr.	—	×	—	×	—
	NIDULARIACEÆ.					
	NIDULARIA (Fr.) Tul.					
33	*pisiformis* (Roth.) Tul.	—	×	—	×	—
	CRUCIBULUM Tul.					
34	*vulgare* Tul.	×	×	×	×	×

	Basidiomycetes : Gasteromycetales *contd.*	N.W.	N.E.	MID W.	S.W.	S.E.
	NIDULARIACEÆ.					
	CYATHUS Haller					
35	*striatus* (Huds.) Fr.	—	×	×	×	×
36	*olla* (Batsch) Pers.	×	×	×	×	×
	olla var. *agrestis* Pers.	—	×	—	—	—
	SCLERODERMATACEÆ.					
	MELANOGASTER Corda					
37	*variegatus* (Vitt.) Tul.	—	×	×	—	—
	variegatus var. *Broomieanus* (Berk.) Tul.	—	—	—	—	×
38	*ambiguus* (Vitt.) Tul.	—	—	—	×	×
	SCLERODERMA Pers.					
39	*aurantium* Pers.	×	×	×	×	×
	aurantium var. *lævigatum* (Fuck.) W. G. Smith	—	×	—	—	—
40	*bovista* Fr.	—	×	×	×	—
41	*geaster* Fr.	—	×	—	—	—
42	*verrucosum* (Vaill.) Pers.	—	×	×	×	×
	CALOSTOMATACEÆ.					
	ASTRÆUS Morgan					
43	*hygrometricus* (Pers.) Morgan	—	×	×	×	—
	TULOSTOMATACEÆ.					
	TULOSTOMA Pers.					
44	*brumale* Pers.	—	×	—	—	—
	SPHÆROBOLACEÆ.					
	SPHÆROBOLUS (Tode) Pers.					
45	*stellatus* (Tode) Pers.	×	×	×	×	×
46	*terrestris* (A. & S.) W. G. Sm.	×	—	—	×	—

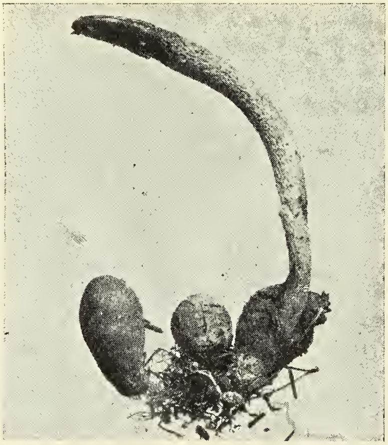

Photo by the author.

Cynophallus caninus **and ' eggs '** × ½.

This well-distributed species occurs each year in a coniferous plantation, Dalton Wood, on the Yorkshire side of the Tees, near Croft, where it has developed a well-defined ring about 8 feet in diameter ; plants were plentiful on September 1st, 1928, when the wood was visited by the Darlington and Teesdale Naturalists' Field Club.

FUNGUS FORAY AT SLEDMERE.

A. E. PECK.

Hon. Sec., Mycological Committee, Y.N.U.

THE Fungus Foray of 1928 (the 344th Meeting of the Yorkshire Naturalists' Union) was held at Sledmere from August 25th to August 30th. Twenty-one persons took part in the proceedings for varying periods.

Accommodation was at the Triton Inn, but the premises known as the ' Rifle Range ' were used as work and exhibition rooms. These premises were kindly placed at our disposal by Sir Richard Sykes, who had also given us the run of the estate.

Photo by] *Polyporus squamosus.* [*F. A. Mason.*

Above (left to right) : A. E. Peck, J. W. H. Johnson, F. A. Mason.

Present were Dr. Harold Wager, F.R.S. (Chairman) ; F. A. Mason, F.R.M.S. ; Greevz Fysher ; J. W. Haigh Johnson, M.Sc. ; R. Fowler Jones ; E. Snelgrove, B.A. ; Mrs. M. Fysher ; Miss M. Hewlett, M.Sc. ; S. D. P. Fysher ; A. Wentworth Ping, M.A. ; and A. E. Peck, Hon. Secretary (members of the Committee ; with Mrs. Wager ; Miss M. E. Grange, B.A. (Consett) ; Mrs. E. M. Morehouse and Miss K. Morehouse (Doncaster) ; Mr. and Mrs. Throup (Bradford) ; Rev. A. Ping, M.A., B.Sc. (Farndon) ; A. Bramley (Bolton Percy) ; Miss Dufty (Doncaster) ; and Miss L. Ingham (Whitby).

The meeting had been decided upon at this unusually early date for a Fungus Foray in order that members engaged in the scholastic profession might take part in the proceedings during the school vacation period.

The result was rather unfortunate, however, for though it be quite true that in some years certain districts may furnish an excellent crop of fungi during the month of August, yet September is almost certain to produce a better crop, and the latter part of September must be regarded as the best time for a foray.

Probably Sledmere and the Wold district, with their waterless dales and readily absorbent soil, will be of greatest interest to mycologists at a date later than in the country generally.

The fungi everywhere seem to be unusually late in appearance this year, so that one might hazard the forecast that there will be a better show at Sledmere during the forthcoming October than was witnessed at the time of our investigation.

The pastures provided very few specimens, but one field furnished a fair dish of the common mushroom, *Psalliota campestris*, which later graced the breakfast table, and was enjoyed. No other edible fungus was similarly employed at this gathering.

Scarcity of specimens intensified the search, and it was surprising how the records gradually grew under this effort until they reached a total of 112. Many records were founded on one specimen only.

Many genera are completely absent from the records. No *Amanita* or *Amanitopsis* were seen, and the only *Lepiota* was one fine *L. procera* which stood 11 in. high.

Perhaps *Collybia radicata*, *Mycena galericulata* and *Fomes annosus*, all of which grow on dead stumps, were the most numerous, while *Gomphidius viscidus* was also met with in good numbers.

Only one *Lactarius*, *L. quietus*, was seen, and no record of *Russula* was made. Last year, at Stamford Bridge, these two genera furnished 14 and 17 species respectively.

Quite an outstanding event was the bringing in, in his motor-car, by Mr. A. Bramley, of a specimen of *Polyporus squamosus* from Fimber. It was symetrical with a central stem, measured 2 ft. 9 in. across the pileus, and was estimated to weigh between two and three stones. It was photographed by Mr. Bramley and by Mr. Ping. The existence of this big fungus had already been related to us. We also heard of one or two giant puffballs in the same direction, but the latter, unfortunately, were never retrieved, and the esculent *Lycoperdon giganteum* is not included in our records.

Perhaps our most interesting discovery was *Tremellodon gelatinosum*, which, though not seen before by any present, furnished no difficulty in determination, as it is our only gelatinous fungus with a spiney hymenium. The species has a genus all to itself. Worthington Smith regards it as belonging to the Hydnaceæ, and (p. 384) gives an illustration of its sub-globose spores on the ovate basidia which are longitudinally septate. The sterigmata are one to five times the length of a spore. Massee and Carleton Rea both include this remarkable fungus in the Tremellinaceæ.

Mr. F. A. Mason, County Recorder, is responsible for the determination of the 'Micro-fungi,' and, in part, for the Mycetozoa and the Discomycetes. His, also, are the annotations in the subjoined list.

May I also here note that his annotations to the list contained in my account of the Stamford Bridge Foray (*Naturalist*, p. 365, December, 1927) were not explained. Therein the * means 'new to Yorkshire,' and † means 'new to S.E. Div. Yorkshire,' as in the present report.

As usual, the evenings were devoted to Lectures. Dr. Wager gave 'Some Physiological Problems of the Fungi,' which may, subsequently, be the subject of an article for *The Naturalist*.

Mr. Peck gave two addresses, viz., 'At a British Association Meeting,' being, for the most part, personal experiences and impressions of the Liverpool Meeting of 1923, and 'With the British Association at Southampton,' 1925. Mr. Peck related (*inter alia*) that after returning from the Presidential Address at Liverpool, the late Mr. W. N. Cheesman, J.P., F.L.S. (a former member of the Mycological Committee and a Past President of the Yorkshire Naturalists' Union, also a Yorkshire magistrate) came to him and said, 'I want to tell you a secret. For the first time in my life I've had my pocket picked, and, have lost all my money.' He thought that he had been 'relieved' whilst boarding a crowded tramcar to go to the Philharmonic Hall. At this time numerous warnings were placarded about Liverpool, 'Beware of Pickpockets.'

Mr. F. A. Mason, in an address on 'The Significance of Fungous Elements in Peat,' after some preliminary remarks on the nature and occurrence of peat, said that the work on peat in Yorkshire had been mainly concerned with the determination of the species of plants, etc., found in the Pennine peat, and he instanced the painstaking work of Messrs. W. H. Burrell and C. A. Cheetham. He spoke of the special qualifications of Mr. Burrell as a bryologist in such investigations, but the latter had not considered organisms lower than the mosses, or possibly the algæ, and there was room for the mycologist to enquire how far his studies might have a bearing on the subject. On this point Mr. Mason profoundly differed from the opinion that the study of the fungi of peat offers little help in the solution of peat problems.[*] His own studies had indicated altogether the contrary insomuch that fungi are largely responsible for plants dying down as the first stage of peat formation ; they bring about changes in the chemical and physical reactions of the plant remains which prevent their further decomposition and thus remain peat ; enter largely into the botanical composition of peat, and may render possible the identification of plants not readily discoverable by other means ; and they are largely, if not entirely, responsible for the red brown to almost black colouration so characteristic of peat. The lecturer then went on to give reasons for his views, and concluded with a microscopical demonstration of some very characteristic fungus mycelia and spores from peat and peat materials.

At the Business Meeting a hearty vote of thanks was accorded to Sir Richard Sykes for permission to visit his estate, and for the use of the ' Rifle Range.'

It is proposed to hold the next Foray at Masham, commencing September 16th, 1929.

The following are the more interesting records :—

* New to Yorkshire. † New to S.E. Division Yorks.

†_Tricholoma bufonium._
†_Clitocybe infundibuliformis_ var. _membranaceus._
†_Mycena galopus_ var. _nigra._
†_M. gypsea._
†_M. rubromarginata._
*_M. plicato-crenata._
†_Marasmius erythropus._
†_M. conigenus._
†_Androsaceus androsaceus._
†_Panus torulosus._
†_Pluteus nanus_ var. _lutescens._
*_Crepidotus ralfsii_ B. and Br.
Hypholoma radicosum Lange.
†_Psathyra corrugis_ var. _vinosa._
† var. _gracilis._
*_P. microrhiza_ (Lasch.) Fr.
†_Bolbitius flavidus._
†_Boletus aurantiporus_ Howse.
†_Polyporus melanopus._
†_P. chioneus._
†_Ganoderma lucidum_ (Leyss) Karst. (=_Fomes lucidus_ (Leys) Fr.).
†_Polystictus hirsutus._
†_Tremellodon gelatinosum._

MICRO SPECIES.

†_Plasmopara nivea_ on _Heracleum._
*_Peronospora leptosperma_ on Knapweed.
†_P. candida_ on Primrose leaves.
†_Erysiphe graminis_ on Oats.

MYXOMYCETES.

†_Ceratiomyxa fruticulosa._

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[*] W. H. Burrell : ' Pennine Peat, _Nat._, 1924, p. 148.

YORKSHIRE NATURALISTS AT SPURN.

F. A. MASON, F.R.M.S., AND W. H. PEARSALL, D.Sc., F.L.S.

(*Continued from page 278*).

VERTEBRATE ZOOLOGY (E. W. Wade) :—For convenience of description we may divide the Spurn area into three, *e.g.*, Kilnsea with its meadows and ditches and the shingle-covered ground near the beacon, Kilnsea Warren and the middle bents, and Spurn proper. In the Kilnsea area the most noticeable birds were the Peewit, almost extinct as a breeding species in the rest of Holderness, but here fairly numerous owing to the protection of the Yorkshire Naturalists' Union, Redshanks increasing yearly, and on the shingle bed Lesser Tern, Ringed Plover much scarcer than in previous years owing to the disturbance of gravel collectors. In the ditches two broods of Mallard were seen, the old birds flapping off into the meadow, while the young submerged all but their beaks or squattered off up the ditches to escape the intruder. Sedge Warblers were numerous, and Reed Bunting were breeding both along the ditches and among the bents. The meadows resounded with song of Skylark, Titlark, Corn Bunting, Yellow Hammer and Whitethroat. Two pair of Shelduck were seen in a shallow pool, the drakes fighting for possession of the ground, though their attack seemed to go no further than flying up in the air at each other and returning to their respective ends of the pool.

The Kilnsea Warren and middle bents are denuded of birds by the visitors who come in increasing numbers in motor-cars, and the marram grass and bushes burnt by sparks from the Spurn engine, which thus destroy the most effective natural means for holding the drifting sand and preserving the peninsula. Two nests of Partridges were destroyed this season in this way. The Spurn area itself is the stronghold of Lesser Tern and Ringed Plover, where the Yorkshire Naturalists' Union protection is most effective. On account of the cold and late spring most of the Tern did not commence to breed till June, but about twenty nests were observed and a good opportunity afforded of watching the nesting habits of the birds. The Ringed Plover had nearly all hatched their first broods and commenced preparing for second nests. Besides these, many Grey Linnets, Skylarks and Reed Bunting were breeding, the latter far from their usual freshwater habitat. Within the Spurn battery itself a little sanctuary is formed, grown thickly with Elder and Sea Buckthorn bushes, where a pair of Turtle Doves were breeding for the first time on record, also Grey Linnet and Common Whitethroat.

There is always some interesting bird life on the Spurn foreshore, and here several pairs of breeding Shelduck were seen ; twenty Curlew ; a large flock of Dunlin, amongst which were three Sanderling ; a flock of Knots, two of which showed rose-coloured breasts ; a few Turnstone, two in full summer plumage (there is hardly a month of the year when these birds are not seen at Spurn) ; two pair of Arctic or Common Tern ; three Oyster Catchers, and one Purple Sandpiper. A few dead Guillemots, clogged with oil, lay on the seashore, unfortunately, a spectacle always seen on a visit to Spurn, and the usual flock of Lesser Black-backed and Herring Gulls, with an occasional Great Black-backed.

One specimen of the Common Brown Lizard was observed.

LICHENS (W. E. L. Wattam) :—SPURN POINT. A study of the narrow portion of the peninsula, known as ' The Neck,' terminating with the Point, did not yield much. This is not surprising when the physical nature of the area is considered. On the western side there are no permanent rocks, simply a shore of ever shifting sand with partially buried wood groynes, and countless erratic boulders of varying size under the influence of every tide. Where protection is given by *Psamma* on the younger dunes a few of the stabilised silicious boulders show small patches of *Xanthoria parietina* Th. Fr. and *Rhizocarpon confervoides* D.C. Among the mosses on these dunes *Peltigera canina* Willd. in fair development, and occasionally a little *P. horizontalis* Hoffm., with *Cladonia pyxidata* Hoffm., *C. fimbriata* Fr., and *C. gracilis* Willd. struggle for existence. On the Humber shore protecting embankments of local chalk have been erected, and where partially demolished within the tidal zone *Verrucaria maura* Wahl. is becoming well established. *Rhizocarpon alboatrum* var. *epipolia* A. L. Sm., *Verucaria calciseda* D.C., and *V. viridula* Ach. are also not uncommon along these chalk enbankments, with an occasional small patch of *Parmelia prolixa* sub-sp. *Delisei* Nyl. On one chalk fragment was *Gyalecta cupularis* Schaer., and on a silicious stone embedded in the dunes, *Lecidia goniophila* Schaer. There is an abundance of *Candelariella vitellina* Müll-Arg. and *Lecanora galactina* Ach. on the plastered surface of the masonry of the fort and other buildings at the Headland, and also *Placodium citrinum* Hepp.

The basal portion of the Peninsula, known as 'The Warren,' although covered with a dense and varied vegetation, chiefly of grasses, is interesting from the fact that there are traces of lichens usually associated with dry heathland. On a few of the moss-covered sandy knolls, where competition with other vegetation is not quite so keen, are *Cetraria aculeata* Fr., *Cladina sylvatica* Nyl., *C. uncialis* Nyl., small patches of the congested squamules of *Cladonia foliacea* Willd., *C. cervicornis* Schaer., *C. coccifera* Willd., and *C. flabelliformis* Wain. In depressions where moisture and mosses are pronounced again occur *Peltigera canina* Willd., and *P. horizontalis* Hoffm. On the faces of old cart ruts, with the moss, *Brachythecium albicans*, occur *Cladonia pyxidata* Hoffm., *C. fimbriata* Fr. and its variety, *simplex* Wainio, and *C. gracilis* Willd.

KILNSEA.—Habitats are very limited, but the following species were noted :—

Physcia hispida Tuck. On brick walls.
Lecanora muralis Schaer. On silicious boulders, walls and posts.
L. galactina Ach. Most abundant on the plastering concrete surface of the fort and other buildings. The sub-sp. *dispersa* Nyl. in similar situations in association with *Placodium citrinum* Hepp.
L. symmictera Nyl. On palings.
L. parella Ach. Brick walls and silicious boulders.
L. atra Ach. Brick walls and silicious boulders.
L. campestris B. de Lesd. Brick walls.
Placodium citrinum Hepp. On plastering and mortar of buildings.
Candelariella vitellina Mull-Arg. Brick walls, earth of embankments, and plastering of buildings.
Xanthoria parietina Th. Fr. Fine bosses on the concrete posts and other masonry of the fort buildings. Tiles of farm buildings.
Cladonia pyxidata Hoffm. Among mosses roadside waste.
Rhizocarpon geographicum DC. Rare. Silicious stones.

EASINGTON.—Corticolous species are not very much in evidence owing to lack of woodlands. There are two small plantations and orchards, with occasional ash, oak, mountain elm and sycamore, in the hedgerows of hawthorn, and oftimes whitethorn. The church and its precincts, farm buildings, and walls chiefly of brick, dwellings of erratic boulders with plastered surfaces, all offer excellent ground for the establishment of saxicolous species. It is, however, only too evident that the lack of constant moisture limits the growth of all the species, and few can be termed luxuriant. The cliffs of boulder clay were traversed for a considerable distance. The constant erosion to which they are subject is plainly observed, and it was not surprising that, with the exception of *Cladonia pyxidata* Hoffm. in depressions where mosses occurred, no other species were noted. There is an entire absence of permanent rock, and the scattered erratic boulders are washed and moved by every tide. The species observed were :—

Peltigera canina Willd. On humus, hedgerow base.

Parmelia physodes Ach. Not plentiful nor well established. Boles of mountain elm.

P. perlata Ach. On apple trees and brick walls. Var. *ciliata* Schaer. On apple trees.

P. saxatilis Ach. Apple trees, brick walls, silicious stones.

P. sulcata Tayl. Boles of hawthorn, mountain elm, and limestone of church.

Evernia prunastri Ach. A depauperate form on brick walls of farm buildings, boles of mountain elm and ash.

Physcia hispida Tuck. Boles of mountain elm, bricks and silicious stones.

Xanthoria parietina Th. Fr. Very fine, and common on brick walls, tiles of buildings and silicious stones. Var. *aureola* Th. Fr. Brick walls, with its form *congranulata*.

Placodium flavescens A. L. Sm. Limestone boulders, church and other buildings.

Pl. citrinum Hepp. Limestone of church and mortar of other buildings.

Candelariella vitellina Mull-Arg. Brick walls, plastering of masonry, silicious stones.

Lecanora muralis Schaer. Silicious tombstones and walls.

L. campestris B. de Lesd. Brick walls.

L. pallida Schaer. Bark of goat willow.

L. galactina Ach. and sub-sp. *dispersa* Nyl. Common on plastering of masonry and silicious stones.

L. varia Ach. Palings.

L. symmictera Nyl. Palings.

L. conizæa Nyl. Palings and hawthorn boles.

L. sulphurea Ach. Silicious stones.

L. atra Ach. Brick walls.

L. parella Ach. Bricks and silicious stones.

L. calcarea Sommerf. Limestone of church.

Pertusaria faginea Leight. Boles of mountain elm.

P. pertusa Salla Torre and Sarnth. Boles of ash and lime.

Cladonia pyxidata Hoffm. With mosses on cliff top.

C. fimbriata Fr. In association on with mosses on wall tops.

C. gracilis Willd. Amongst grasses roadside waste.

Lecidia coarctata Nyl. Silicious stones embedded in the earth and walls.

L. albocoerulescens Ach. Silicious boulders of walls.

Bilimbia aromatica Jatta. Old mortar of walls.

Bacidia umbrina Branth and Rostr. Silicious stones.

Buellia canescens De Not. Silicious stones.

Verucaria calciseda DC. Limestone of walls.

V. muralis Ach. Mortar of walls.

WELWICK.—The few hours spent here proved interesting, and the following list of species noted can without doubt be considerably extended, viz. :—

Parmelia perlata Ach. and var. *ciliata* Schaer. Apple trees.

P. saxatilis Ach. Apple trees.

P. fuliginosa Nyl. Silicious stones. Var. *lætvirens* Nyl. Palings.

Evernia prunastri Ach. Boles of apple and ash.

Physcia hispida Tuck. Brick walls.

Xanthoria parietina Th. Fr. Brick walls. Var. *aureola* Th. Fr., with its form *congranulata*. Brick walls.

Placodium flavescens A. L. Sm. Limestone boulders.

Pl. citrinum Hepp. Lime grouting of walls.

Pl. aurantiacum Happ. Ash boles.

Pl. ferrugineum var. *festivum* A. L. Sm. Silicious boulders.

Candelariella vitellina Müll-Arg. Brick walls, plaster of masonry silicious stones.
Lecanora subfusca Ach. Boles of mountain elm.
L. campestris B. de Lesd. Brick walls.
L. atra Ach. Brick walls.
L. galactina Ach. and its sub-sp. *dispersa.* Silicious stones, brick walls, and plaster of masonry.
L. calcarea Sommerf. Lime grouting of walls.
L. varia Ach. Palings.
L. symmictera Nyl. Palings.
Cladonia pyxidata Hoff. Amongst mosses wall tops.
C. fimbriata Fr. Amongst mosses wall tops.
Lecidia coarctata Nyl. Silicious stones.
L. parasema Ach. Wood groynes, Humber shore, with its var. *elæochroma* on the smooth bark of the stems of *Atriplex portulacoides.*
Rhizocarpon alboatrum var. *eipiolia* A. L. Sm. On limestone boulders.
Rh. confervoides DC. Silicious boulders, Humber shore.
Verrucaria maura Wahl. Chalk boulders, Humber shore.
V. calciseda DC. Chalk boulders, Humber shore.
V. viridula Ach. Chalk boulders, Humber shore.

GEOLOGY (T. Sheppard) :—The geology of the area was briefly described on the excursion programme. The party walked along the shore from the Spurn towards Out Newton, and had an opportunity of securing a fine series of fossils—carried to their present position by glacial action and by the trend of the tides. A fine mammoth tooth was secured in a local hostel, and is now on view in the Tithe Barn Museum.

THE TITHE BARN, EASINGTON.—This interesting building, erected about the year 1500, has been threatened with destruction for many years : a tenant even going to the extreme of placing a thrashing machine in the barn and placing the chimney through the thatched roof ! The East Riding Antiquarian Society has appointed a committee to preserve the building, and while, at the time of the visit of the Yorkshire Naturalists' Union, these arrangements were not complete, the members held their meeting under its roof, and were the first officially to be present in the building in its capacity as a folk-lore museum. Although only a portion of the barn was available as a museum, there were sufficient exhibits to give an indication of the value of the collection when in its complete form.

——:o:——

The Geology of Malayan Ore-Deposits, by **J. B. Scrivenor.** London : Macmillan & Co., xv.+216 pp., 16/- net. Mr. Scrivenor, formerly of H.M. Geological Survey, is now the geologist to the Federated Malay States Government, and in his volume he has brought together an admirable survey of the various ore deposits of Malaya, which is a particularly rich area for quite a large number of valuable minerals. Geologists and mineralogists will be glad to welcome this very full account of Malayan ores so far as our present knowledge goes.

The Determination of Minerals under the Microscope, by **John W. Evans.** London : T. Murby & Co., xii.+110 pp., 7/6 net. Probably no greater authority on this subject exists than the venerable Past President of the Geological Society of London, and Messrs. Murby are to be congratulated on securing a work from his pen. The book has been written to assist students to realize the principles on which the optical study of minerals rest without the use of advanced mathematics. While naturally the subject is somewhat technical, there can be no question that the student of mineralogy will welcome the monograph in its present compact form.

BRITISH ASSOCIATION NOTES.

Nearly 300 papers and addresses were delivered at the British Association meeting at Glasgow. Some of them were heard quite easily. Many, however, were inaudible to people sitting quite near to the platform, and we think the time has come when the Association should not allow its members to waste considerable time endeavouring to hear papers apparently given in dumb show.

Nature, No. 3071, which was available to the members at Glasgow, contains an excellent summary of the various addresses, etc., and the President's address in full.

The University of Glasgow conferred the following degrees upon visitors to the British Association :—D.D. : The Rev. Professor Shailer Mathews, of Chicago. LL.D. : Professor Sir William Bragg ; Sir Thomas Henry Holland ; Adrien Loir, of Le Havre ; Frank Lincoln Stevens, of the University of Illinois ; Professor Franz Eduard Suess, Vienna ; Professor Edward Alexander Westermarck, London ; Professor Pieter Zeeman, Amsterdam.

It was announced at the General Committee Meeting that in response to the appeal made by Sir Arthur Keith last year at Leeds, Down House, the home of Charles Darwin, had been secured as a memorial to Darwin, through the generosity of Mr. George Buxton Browne.

At the Glasgow meeting the Association elected its first three honorary members. These were Sir Charles Parsons, Sir Alfred Yarrow, and Mr. George Buxton Browne, all being benefactors to the Association.

A Yorkshire subject was introduced to the Anthropological Section by Dr. Arthur Raistrick and Miss S. E. Chapman, who discussed the lynchet and enclosure systems of Upper Wharfedale, especially in the district of Grassington. Here, the authors stated, the Anglian settlers from the ninth century onward cultivated the lower land between the first scarp and the river flats and made settlements at most of the now existing villages. Moreover the strip-lynchet fields are almost perfect, and have been mapped. Kilnsey with Conistone was cited as a complete example of an Anglian village organisation persisting through the Norman period into the fifteenth century.

We could not refrain from seeing the following type-written gem from the notice board in the Press Room at the the meeting : ' Lost.—Will anyone who has found a pair of gold-rimmed spectacles lost on Thursday evening kindly return them to the Secretary ? ' To this the following was added : ' Note.—These spectacles have since been lost and found three times and are now in possession of the owner. He will be obliged, however, if everyone still maintains a look-out for them, as they are sure to go again.'

On inviting the British Association to visit Bristol in the near future, the Chief Magistrate of Bristol stated that Bristol was said to be ' lousy with money.' Later, in inviting the Association to Leicester, its Lord Mayor stated that Leicester had ' eight millionaires.'

The meeting for 1929 will be held in South Africa ; that for 1930, at Bristol ; for 1931, the centenary year, will probably be in London.

Many ' Lions ' were keenly disappointed that there was no ' Red Lion Dinner ' this year at Glasgow. One wonders why ? Surely ' Jackals' are common and cheap enough ?

The streets of Glasgow were fairly clean. But this was due to the excessive rains.

We learn from the press that ' the Bishop of London, speaking at St. Andrew's, said : " While listening in at the wireless last night, I thought I heard someone say that it would soon be possible to make a soul in a laboratory. If I heard aright, then it was the sheerest rubbish in the world. Science and religion help one another if they keep in their own spheres. Man is a praying animal, and you can't make him anything else. He was meant to be religious and you can't kill religion." ' Unfortunately for the Bishop, the word used was ' cell ' not ' soul.'

The enamelled badge given to the members was particularly artistic, and we should like to congratulate the designer. In addition, it entitled the owners to free rides on the Corporation trams and busses.

The Kelvingrove Art Gallery and Museum was an ideal centre for a reception, but getting away from it, in the pouring rain, was an experience.

Probably through no fault of the local organising committee, the excursions arranged for the members were too many and for too long distances, so much so that many had to be curtailed or cancelled. On the Saturday, a beautiful sunny day during a ' dour ' week, an attenuated party revelled in the glories of the scenery in a trip down the Kyles of Bute. On Sunday, a few ' lucky ones ' visited Edinburgh, under ideal conditions; returning to find that Glasgow had been swilled, again, by a thunderstorm, during their absence. The beautiful War Memorial at Edinburgh, the finest we have seen, was very impressive.

The Conference of Delegates of Corresponding Societies had a ' curate's egg ' status. It was excellent in parts. But much time was wasted on trivialities, and the President, quite properly, resented having to find drinking water and drawing pins. Only those who have attended these Conferences for the past thirty years know of the difficulties of a new officer who has not previously taken part in the discussions. If the Conference of Delegates is to continue, some change is necessary.

The Member's Card, reduced in size so as to fit into the waistcoat pocket, was much appreciated in its smaller form. We wonder who made this suggested improvement.

The Journal of Scientific Transactions with summaries of many of the papers read, was a welcome acquisition to the members. This was supplemented by an admirable *Programme of Local Arrangements*, and a *Daily Time Table.*

——: o :——

W. S. Berridge writes on British Deer in *The Animal World* for September.

' The Office of Master of the Swans ' is described in *British Birds* for September.

' The Botany of Worcestershire,' by Carleton Rea, appears in *The Medical Herbalist* for September.

' Eagles ' is the title of an article by Riley Fortune, appearing in No. 4 of *The Trail*, the official organ of the 1st Beverley Group of Boy Scouts.

Prof. H. H. Swinnerton figures and describes a new species of fish (*Semionotus*) from the Keuper of Nottingham, in *The Geological Magazine* for September.

The Journal of Conchology for August contains notes on ' The Affinities of Ceciloides and Ferussacia, illustrating Adaptive Evolution,' by H. Watson ; and ' The Development of the Colour of *Arion ater*,' by A. E. Boycott.

The August number of *The Journal of Ecology* is a substantial publication, with over 200 pages and plates. Among the many interesting memoirs therein are ' The Ecology of Spitsbergen,' by V. S. Summerhayes and C. S. Elton ; ' The Bryophytes of Middlesex,' by P. W. M. Richards ; ' Ecology of Divis,' by M. P. H. Kertland ; ' Effects of Exposure upon certain Heath Plants,' by D. N. E. Bright ; ' Warburton Moss : a Study of certain Semi-natural Plant Communities in North-east Cheshire,' by E. P. Evans ; ' Notices of Publication on Animal Ecology,' by C. Elton ; ' Further Changes in the Salt Marsh and Sand Dunes of Holme-next-the-Sea,' by T. R. Peace, and ' The Ecology of Mycorrhiza,' by M. C. Rayner.

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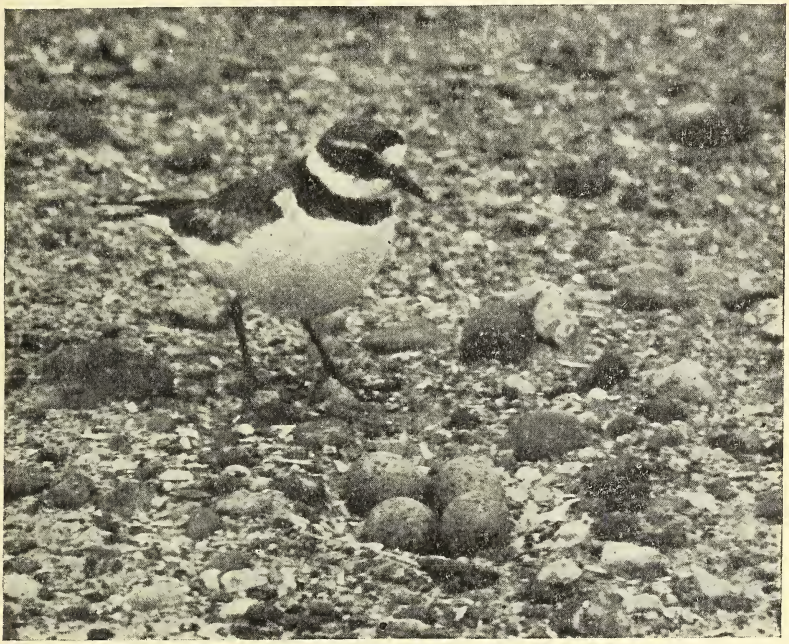
NOTES AND COMMENTS.

THE ESSEX NATURALIST.

Among the contents of *The Essex Naturalist*, Vol. XXII., Part 3, are many interesting addresses, including a ' Report on Excavations in Loughton Camp, Epping Forest,' by S. Hazzledine Warren ; ' A Plea for More Systematic Attention to Aquatic Biology in Field Club Work,' by D. J. Scourfield ; and ' The Birds of the Thames Valley in 1926-8,' by William E. Glegg. With the last paper appears some views of birds and their eggs, one of which we are kindly permitted to reproduce. This photograph might have been taken at Spurn Point.



Ringed Plover approaching Nest, Essex Coast, June, 1927.

AGES OF HUMAN SKELETONS.

From *The Museums Journal* for October we learn that in reference to a skeleton in the Brighton Museum, Sir Arthur Keith hesitates between it being of the late Bronze or late Celtic Age, while Professor F. G. Parsons regards it as Saxon. These two opinions from such well-known experts show how undesirable it is to attempt to date skeletons unless something is found in association therewith. When the skeleton was mentioned in the same journal in August it was then stated that 'the burial probably belongs to the late Neolithic or early Bronze Age,' though in this case the authority for the statement was not given. Apparently the skeleton may be anything between Neolithic and Saxon: from which we assume it is probably comparatively modern!

CROWDED MUSEUMS.

Our contemporary, *The Daily Mail,* has at last made a discovery, and in the issue for October 10th, with no fewer that six headlines, the first two being by far the largest type on the whole page, we learn 'Treasures in Cellars. Museum too full to show them. From our Special Correspondent. York.' 'In the cellars of York Museum, and in drawers hidden away under exhibition cases, I have to-day seen a collection of specimens of ancient flint instruments, mediæval pottery, and old prints which would delight the heart of a collector. They cannot be exhibited because York Museum is crowded out.' And so on! We remember seeing precisely these conditions over thirty years ago, and have been familiar with them during our visits to these cellars on many occasions since. Mr. H. M. Platnauer, a former Keeper, his successor, Mr. Oxley Grabham, and the present Keeper, Dr. Walter Collinge, have frequently drawn attention to these conditions in their reports. It is natural to find therefore, that at long last our leading newspaper has made a similar discovery, and 'tells the world.'

THE WHITBY MUSEUM.

Not to be outdone by *The Daily Mail*, *The Daily Chronicle* for October 15th gives a similar cry for Whitby. In seven head-lines in large type we learn:—'Whitby's Plea for Bigger Museum—Priceless Relics in Small Quayside Room—Claim to Fame—Whitby, Sunday.'

AN AMAZING MUSEUM.

We then learn:—'In a small room on the quayside here is one of the most amazing museums in the country. There are thousands of practically priceless relics piled against each other in an astounding manner. In one case there are tiny bones from a mammoth, a slender-nosed rhinoceros, an Irish elk, a reindeer, a fox and a lion alongside a stalactite, some of the first silhouettes, a model of one of Whitby's first life-boats, a set of antlers, a Royal Proclamation and some ancient paintings. This is only typical of many of the other cases.'

A 'LOCAL COLLECTION.'

To continue:—'All this is due, of course, to the shortage of space, and a determined effort is now being made to secure a bigger building in which to lodge the growing collection. This is to adjoin the new Pannett Park Art Gallery, and when laid out properly will be one of the most interesting collections in England. Everything in the exhibition *has a direct association* with Whitby, and there seems good reason for the claim that was given to me that it must be the finest " *local* " museum. The extensive collection of South Sea exhibits were brought by local seamen, all the Bronze Age and Roman relics, the sea shells, sea birds and butterflies, were discovered here, while the magnificent collection of fossils is composed of local " finds." '

THE LEEDS MUSEUM.

' Elmete,' writing in the *Yorkshire Weekly Post* for October 6th, states ' Mr. Henry Crowther, the Curator of the Leeds City Museum, who is shortly to retire, is one of the most remarkable men in the country. . . . He must have given tens of thousands of lectures in his time. . . . Mr. Crowther is retiring from the Curatorship of the Museum, which he has held since the early nineties.' Mr. Crowther, like some more of us, doubtless prays, ' preserve us from our friends ' ! Let us assume that Mr. Crowther was appointed Curator in 1890, and has lectured every night since, weekdays, Sundays, Bank Holidays, Christmas Days, Good Fridays, during his holidays, and, all through the war; he still falls very far short of 'tens of thousands.' ' Elmete ' then goes on : ' Speaking of Mr. Crowther's lectures to school children, he has given these annually since 1901, and in that time it is reckoned that half a million children and 12,000 teachers have listened to him.' We believe these lectures were given round about Christmas. If so, and assuming that the formidable number of 500 children attended each lecture, forty such lectures would have to be given annually, each being accompanied by twelve teachers. ' Elmete ' naively adds: ' Formidable figures these.' We add, would that they were anywhere near reliable.

ANOTHER LEEDS MUSEUM.

In *The Yorkshire Weekly Post* for October 6th, appears the following paragraph, headed ' Calvert's Museum ' : ' This collection is now to be seen at 10 Commercial Street, Leeds. Mr. C. Mosley points out that it contains no less than 15,000 different specimens, including quadrupeds, birds, reptiles, fishes, insects, corals, and so on. The whole are displayed in a manner both tasteful and effective : the shells alone, numbering a thousand species, to each of which is affixed its name and locality. Trophies of ancient arms, armour, and other implements of war, are also exhibited. The museum is open each week-day, admission 1/-.' We believe Calvert's Museum did exist in Leeds about a century ago, but the present generation seem to know nothing about it. Apparently Mr. C. Mosley is older than we took him to be.

THE NOTTINGHAM MUSEUM.

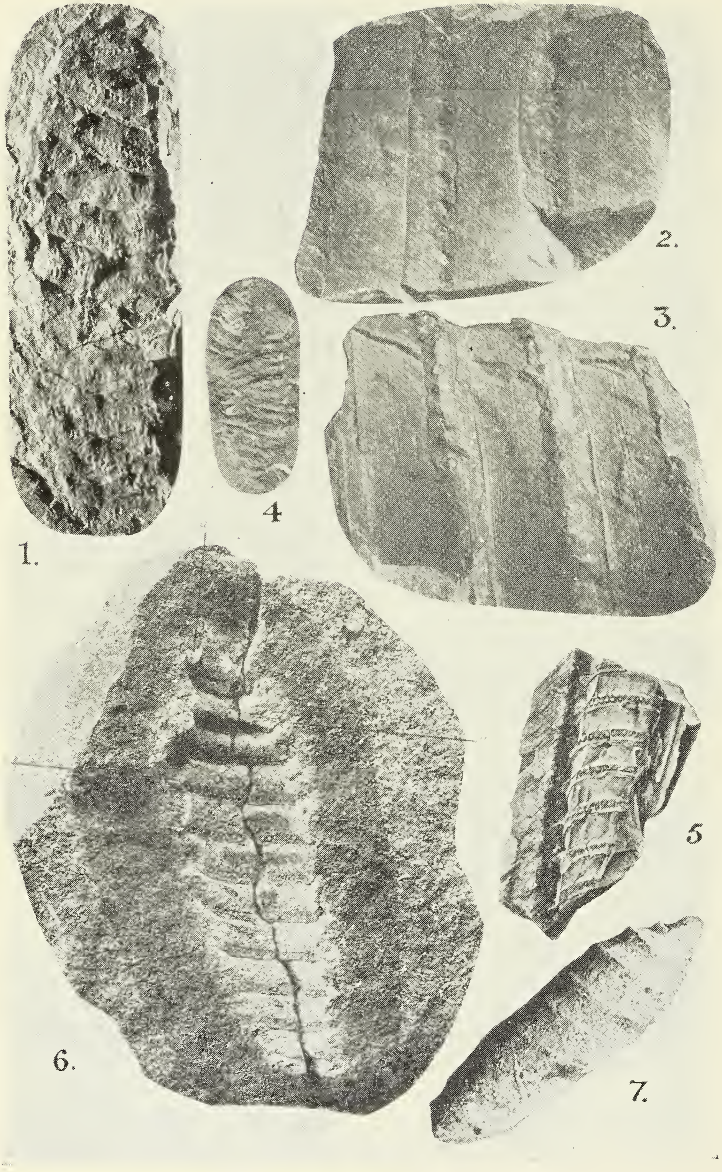
From the *Fiftieth Annual Report of the Art Museum of Nottingham* just to hand, we gather that 'Great improvements have during the past year been carried out in Castle Road. The dilapidated house known as Rock House, and the insanitary cottages adjoining, have been pulled down, and the site, including that of the Drill Hall, has been laid out as a garden. The beautiful XIV. Century arch of the Castle Bridge has been opened up, and the strength of the outer fortifications is now apparent. The laying out of the site as a public garden has been carried out by the Grounds Staff, under the direction of the Grounds Superintendent, and the thanks of the Committee are due to him for the excellent result.' The Curator, Mr. G. H. Wallis, has also kindly sent us the illustrated catalogue of their Jubilee Exhibition, together with an account of the Proceedings of the Celebrations, already referred to in these columns, in which the present writer had the privilege of taking part.

NEW YORKSHIRE APHIDES.

F. V. Theobald describes the following new British Aphides, in *The Entomologist's Monthly Magazine* for October:—*Macrosiphum nigrocampanulæ* and *Rhopalosiphoninus tuberculatus*, both on the Giant Campanula, from Settle; and *Amphorophora digitalisii*, on Foxglove at Fallingfoss, near Whitby. All were collected by Mr. G. B. Walsh.

——:o:——

A Precocious Young Otter.—On September 13th, Mr. Greenwood Crabtree, of Greystone Manor, Burley-in-Wharfedale, asked me to come to see a wild animal that his cowman had killed the day before. It had been chasing poultry in an open field, and threatened the cowman, and eventually was apparently chasing a cow! Judge my surprise when I found the dead body of a half-grown Otter, measuring from the tip of the nose to the root of the tail 15½ inches, and the tail a further 9 inches. It seemed such an extraordinary thing for the shy Otter to do. I naturally thought it must be starving, but on examination I found it to be sleeky fat, and with a very full stomach. The cowman seemed to be a very decent fellow, and one not likely to exaggerate. Its apparent attitude towards him caused him to secure a clothes prop, with which he killed it. Greystone Manor is only about 150 yards from the River Wharfe, and in between there is a natural undrained swamp. Doubtless a brood of Otters has been reared, as it is reported that a similar young Otter of about the same size and age, was caught the week before at Burley-in-Wharfedale.—H. B. BOOTH.



Fayolia.

THE GENUS *FAYOLIA*.

R. CROOKALL, Ph.D., F.L.S,

PLATES VIII. AND IX.

In recording a new species of *Fayolia* from the Middle Coal Measures of South Wales, I take the opportunity of revising the genus, and of correcting Renault and Zeiller's restoration of the organism, which was in error, the apex having been mistaken for the base, and *vice versa*. *Fayolia*, *Palæoxyris* and *Vetacapsula* are usually regarded as representing the egg-cases of sharks. The discussion of their nature and affinities, however, is reserved for a future paper.

Though *Fayolia* ranges from the Upper Devonian to the Lower Permian, and occurs both in Europe and America, very few specimens are known. The first British example of the genus, found by Mr. G. Best in the Lower Coal Measures of Durham, was described by Professor Seward[1] in *The Naturalist* in 1894, and provisionally referred to *F. dentata* Renault and Zeiller. The only other records of *Fayolia* from Britain are represented by four specimens collected by the late L. Moysey[2] from the Middle Coal Measures of Derbyshire. These include two examples of *F. crenulata* Moysey, one of *F. moyseyi* Pruvost, and a badly preserved specimen somewhat resembling *F. sterzeliana* Weiss,[3] but which was specifically indeterminable. The present specimen was collected by Mr. W. D. Ware, of Ystradgynlais, Swansea, and came from the Nine-foot Seam at Ystradgynlais Colliery, Ystrad, near Swansea. With the exception of the Durham specimen, all the British examples of the genus are preserved in the Museum of Practical Geology.

REVISION OF THE GENUS.

Under the generic name of *Spiraxis* Newberry,[4] in 1885, described and figured casts bearing spiral markings from the Devonian Sandstones of the Chemung Group of North America. He distinguished two species, *S. major* from southern New York State, and *S. randalli* from Warren, northern Pennsylvania. Newberry was inclined to regard his fossils as the stems of algæ, though observing that sponges are sometimes fossilised in a similar manner. He gave the following diagnosis of the genus : ' Body cylindrical, or sub-fusiform, somewhat abruptly conical above, more gradually tapering below; surface traversed by two parallel revolving spiral ridges, in some species closely approximated, in others separated by intervals half as wide as the diameter; no trace of internal structure or distinct surface markings visible.' The single known specimen of *S. major* (Plate IX., fig. 2) is cylindrical, though one end tapers to a blunt point. The other extremity is broken. The specimen is 2·5 cm. in diameter, and 17 cm. long, and is traversed by two flattened spiral ridges at an angle of between 30 and 45 degrees. A smooth furrow, about 1·2 cm. wide separates each successive pair of ridges. Several examples of *S. randalli* (Plate IX., fig. 3) were found, and showed that the body is fusiform. This species is much smaller than *S. major* (7 or 8 cm. long by 1·5 to 2 cm. in diameter). The double spirals cross the body at about 30 to 45 degrees, though, as in most specimens, the angle made varies somewhat with their position on the organism. Newberry[1] observed: 'From *S. major* this species may be distinguished by its smaller size, its somewhat curved or sinuous form, and the closer approximation of the raised ridges, which are also more flattened and relatively broader.' The specimens are preserved in the School of Mines, Columbia College. There can be no doubt that these fossils are identical with *Fayolia*, as a comparison with Professor Seward's fig. 2[2] will show.

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[1] Seward, A. C., pp. 233-240, plate, figs. 1, 2.

[2] Moysey, L., *Quart. Journ. Geol. Soc.*, Vol. LXVI., 1910, p. 337.

[3] Weiss, Ch. E., *Jahrb. d. K. Preuss. Geol. Landesanst.*, 1887, Pl. IV., fig. 1, p. 94.

[4] Newberry, J. S., *Ann. New York Acad. Sci.*, Vol. III., 1885, pp. 219-20, Pl. XVIII., figs. 1-3.

Stainier[3] figured and described a poorly preserved, practically cylindrical, cast from the Upper Devonian of Belgium as *Spiraxis interstrialis*, comparing it with Newberry's figures. As with most casts of *Fayolia* and *Palæoxyris*, it was slightly crushed in fossilisation, and consequently elliptical in transverse section. It has a maximum width of 2·5 cm., and measures 14·0 cm. in length, but is incomplete, the upper end tapering towards a point and the lower end being rounded. The body bears projecting spiral ribs which cross it at an angle of 45 degrees, the successive turns being about 2 cm. apart. Between these, and parallel to them, run a number of striæ, separated by a space of about 2 mm. Stainier's species must also be regarded as representing a specimen of *Fayolia*.

In 1885, Lester Ward[4] figured, but did not describe, a specimen which he regarded as representing a Cryptogamic plant from the Laramie Group (Upper Cretaceous) of Clear Creek, Montana, U.S.A. This he called *Spiraxis bivalvis*. The fossil is 10 cm. long, with a maximum width of 3·7 cm.

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[1] Newberry, J. S., *op. cit.*, p. 220.

[2] See Plate VIII., fig. 7.

[3] Stainier, X., *Bull. Soc. belge Géol.*, Vol. VIII., 1894, Mem., p. 23, text-fig. p. 24.

[4] Ward, L., *U. S. Geol. Surv.*, Ann. Rep., VI., 1885, p. 405, Pl. XXXI., fig. 3.

It is practically uncrushed and roughly fusiform, the apex tapering fairly rapidly, but the base is broken. Three spirally arranged grooves, 5 to 6 mm. apart, occur on the apical portion. The centre is enlarged and somewhat confused, though it may be compared with the distorted region almost invariably found in *Palæoxyris*. In the lower half of the specimen the spirals are very indistinct. The state of preservation of this fossil is such that it cannot be included in *Fayolia*, or any allied genus.

Well preserved examples of *Fayolia* were first found in France, in the Stephanian of the Commentry Coalfield, by M. Fayol, Director of the Commentry mines. They occurred in the beds above La Grande Couche, especially in the Tranchée de Forêt, 26-33 feet above that seam, and were described in 1884 by Renault and Zeiller,[1] who instituted the generic name in honour of their discoverer. These authors defined their genus in 1890[2] as follows : ' Body fusiform or cylindrical, tapering towards a point at the two extremities, and carried on the end of a pedicle. Body formed by the union of the margins of two valves whose surfaces are more or less concave, and which are wound in a spiral manner, enclosing a central cavity. A little above the sutures, the valves are marked by a series of small circular or elliptical scars. Each suture carries a helicoidal and spreading collarette, the margin of which may be either entire or denticulate.'

Fayolia is clearly closely related to *Palæoxyris* and *Vetacapsula*.[3] Whereas *Fayolia* and *Palæoxyris* are found both in Europe and North America, *Vetacapsula* is apparently restricted to Europe (only one specimen being known from outside Britain — from the Russian Carboniferous). In *Vetacapsula* the valves are typically erect (though in two species they show a slight twist locally). In *Palæoxyris* and *Fayolia*, on the other hand, they are definitely spirally twisted, the chief distinguishing characters between these two genera consisting of the presence in *Fayolia* of the ' collarette ' and of spines (usually indicated as spine-scars only). It may also be pointed out that, while in *Palæoxyris* and *Vetacapsula*, it is usual to find an enlarged and distorted region situated at, or rather below the middle of the body (representing, no doubt, the site of an original essential organic structure), this appears to be absent, or at least much less marked, in *Fayolia*. In the more frequent genera, *Vetacapsula* and *Palæoxyris*, the two terminations of the organism (the 'beak' and the 'pedicle') are well known, though the beak was apparently the more delicate end and is seldom entirely preserved. In these groups the beak was of definite length and ended in a sharp point, while the pedicle tapered gradually, and appears to have been of indefinite length. Following the arrangement on the body, the ribs in the pedicle of *Vetacapsula* were parallel to the axis, and those in the pedicle of *Palæoxyris* were spirally turned.

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[1] Renault, B., and Zeiller, R., *Compt. rend.*, Vol. XCVIII., 1884, p. 1391.

[2] Renault, B., and Zeiller, R., *Études sur le terrain houiller de Commentry*, St. Étienne, 1888-1890, Pt. 1, p. 15.

[3] See Crookall, R., *Summary of Progress* for 1927, *Mem. Geol. Surv.*, 1928, p. 93.

It may here be said that, owing to the careful collecting of Mr. W. D. Ware, a further example of *Vetacapsula kidstoni* Crookall has been brought to light. It was collected from above the first marine band (at 390 yards from surface, or 220 yards below No. 2 Rhondda Seam) in the Cefn Coed Sinking. It is practically complete, and measures 12 mm. in length and 2·5 mm. in breadth. The two ends taper and there is no marked central ridge (such as occurs in the larger species but the absence of which is characteristic of most of the smaller species of the genus). Six ridges occupy the central (widest) part of the body, running longitudinally and parallel to the contour of the fossil. The specimen is slightly non-symmetrical. The counterpart of this fossil is preserved in the National Museum of Wales, Cardiff. This example is rather smaller than those previously found (which were about 1·4 cm. long by ·5 to ·6 cm. broad), but there can be no doubt as to its specific identity with *V. kidstoni*.

Renault and Zeiller's Restoration.

The terminations of the organism in *Fayolia* are less well known, and, in fact, have been hitherto misunderstood and misrepresented. It is often very difficult to distinguish the base from the apex in fragmentary examples of *Palæoxyris*, *Vetacapsula* and *Fayolia*, and mistakes have occurred. Thus, there can be no doubt that Renault and Zeiller, in figuring their specimens of *Fayolia*,[1] and in drawing their restoration,[2] confused the two terminations by inverting their figures.

On Plate IX., fig. 7 is shown a copy (half-size) of their reconstruction, which illustrates the following features:

(1) The fusiform body, bearing a collarette, in this species with a dentate margin.

(2) Spines (directed towards the 'apex'), or spine-scars (each series being a little above one of the spiral ribs).

(3) The collarette, depicted as becoming free towards the 'apex,' and ending in tapering points running parallel to the axis of the fossil.

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[1] Renault, B., and Zeiller, R., 1888, *op. cit.*, Pl. LXI., figs. 5, 6; Pl. LXII., figs. 1, 2.

[2] Renault, B., and Zeiller, R., 1884, *op. cit.*, p. 1392.

(4) A bluntly rounded 'apex,' and,

(5) An incomplete, untwisted pedicle, the margins of which are practically parallel.

On the same Plate, figs. 4 and 5, are shown two almost complete examples of *F. dentata* as figured by Renault and Zeiller. These were described in the Explanation of Plates as "complete specimens,' and are probably the examples on which their restoration was mainly based. I have placed them in the position in which they were originally figured. It will be seen that the lower end in the figures (depicted as the pedicle by Renault and Zeiller) not only tapers fairly rapidly towards a point, but that there are indications of its having been twisted on its axis, like the blade of a ship's propeller. The single twist in this region is better shown in Renault and Zeiller's Plate LXI., fig. 5 (lower end), where it is identical with that found on the beak of *Palæoxyris*. *The lower extremity here figured on Plate IX., figs.* 4, 5 *and* 7, *undoubtedly represents the tapering beak which was of definite length, and showed a single twist on its axis.*

The upper extremity of the specimens, as figured, is seen to taper very gradually and, especially in fig. 4, to bear lines crossing each other approximately at right angles.[1] This end is clearly an extension of the body on which the spiral ribbing is continued, exactly as in the pedicle of *Palæoxyris*. The lines which apparently cross each other are merely due to compression of the organism in fossilisation.

The upper extremity, therefore, as figured by Renault and Zeiller, and reproduced on Plate IX., figs. 4, 5 *and* 7 *is not the 'apex' but the base, or pedicle of Fayolia.* On the body and pedicle, one set of intersecting ribs (the uppermost) naturally stands out clearer than the other. This was indicated on the 'apex' of the restoration by parallel lines running in one direction only, and although lines intersecting these were shown in the figure of the specimen, they were omitted from the restoration. By comparison with *Palæoxyris* we may be sure that the pedicle was not bluntly rounded and short, but was comparatively long and tapered gradually.

I have amended Renault and Zeiller's reconstruction of *Fayolia* on Plate IX., fig. 8, and it will be seen that, whereas on their conception of the organism there appeared to be several differences between these genera, it is now brought more into line with *Palæoxyris*. The similarity of the two forms might suggest that they merely represent one organism in different states of preservation—*Fayolia*, bearing a collarette and spines, being an outside cast or impression, and *Palæoxyris* being the cast or impression of the internal cavity. This, however, cannot be true, as internal and external casts of both genera are known, and the generic characters are maintained.

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[1] For the sake of clearness, I have slightly exaggerated the top line bearing to the right, but this does not affect the obvious interpretation of the structure.

It will also be clear that in *Fayolia* the spines were not directed towards the apex, as originally depicted, but towards the base, and that they were situated not above, but a little below the spiral ribs.

SPECIES OF *FAYOLIA*.

FAYOLIA DENTATA Renault and Zeiller.

Plate IX., figs. 4 and 5.

This species, from late Stephanian rocks in the Commentry Coalfield, is described[1] as follows: 'Body fusiform, 8-16 cm. long, 15-25 mm. broad across the middle, borne on a smooth or finely striated pedicle, and formed by the marginal union of two concave valves, which are 5-10 mm. wide, twisted in a spiral, and showing 6-7 turns of the spiral. Valves marked at 1-2 mm. above the sutures by a series of small round scars, ·75-1·5 mm. in diameter, situated 1·5-3·0 mm. apart from centre to centre, sometimes bearing bent or straight spines with fine longitudinal striations 12-25 mm. long. The suture lines of the valves are slightly raised, and carry a spiral collarette with a finely dentate or fringed margin, from 5 to 6 mm. wide, apparently becoming free towards the apex of the fossil, and gradually diminishing in width to end in a vertical point and lose its dentate margin.' The angle formed by the ribs in crossing the body varies from 15 to 30 degrees. It should be pointed out that Pruvost describes a maximum of five turns in the spirals of this species. A specimen of *F. dentata* and its counterpart are preserved in the Kidston Collection (Nos. 3842, 3843).

FAYOLIA DENTATA Seward.

Plate VIII., figs. 6 and 7.

The specimen, which came from the Lower Coal Measure sandstones at Stainton Quarries, Barnard Castle, Darlington, agrees in most respects with *F. dentata* Renault and Zeiller, the species to which it was provisionally referred. It is 8 cm. long by 2·7 cm. wide at the broadest point, but the spine scars are smaller and more closely situated than is usual in that species, in this feature resembling rather *F. strezeliana* Weiss. In the latter species the scars are 1 mm. in diameter, about ten occurring in 17·5 mm., while in *F. dentata* Renault and Zeiller they are ·75-1·5 mm. in diameter and 1·5-3·0 mm. apart. In the Darlington specimen, however, they appear to be $\frac{1}{3}$ mm. in diameter, and ten occupy the space of 1 cm. It is probable that Professor Seward's specimen is distinct from *F. dentata*, and should be renamed *F. besti*, as suggested by him. I have not, however, had the opportunity of examining this fossil. The collarette is not preserved in *F. dentata* Seward, though its original presence is indicated by narrow and fairly deep grooves.

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[1] Renault, B., and Zeiller, R., *op. cit.*, 1888, p. 22, Pl. XLI., figs. 5-9, Pl. LXII., figs. 1, 2.

FAYOLIA GRANDIS Renault and Zeiller.

Plate IX., fig. 1.

F. grandis, also found in the late Stephanian rocks of the Commentry Coalfield, is described[1] as follows: 'Body cylindrical, tapering at the two ends, 3-4 cm. wide, and more than 40 cm. long. Composed of two valves united by their margins and forming a spiral with at least 8-10 turns, concave, surface finely striated. Valves showing, 5-6 mm. above the sutures, a series of circular or elliptical scars 2-4 mm. high, 2·3 mm. broad and 3·8 mm. apart. The lines of suture of the valves project slightly and bear a spiral spreading collarette 5-8 mm. broad, the margin of which is entire.' The ribs form an angle of about 45 degrees.

In 1884, Weiss[2] had recorded a cast (which he compared with *Calamites*) as *Gyrocalamus palatinus* from the Lower Permian (Lebacher Beds) of Alben, north of Cusel, Germany. (See Plate IX., fig. 6). After seeing Renault and Zeiller's account of *Fayolia*, Weiss referred his specimen to their genus. It was provisionally regarded by Renault and Zeiller as being identical with *F. grandis*. Schenk was inclined to agree with Weiss that *Gyrocalamus* was an abnormal Calamite stem, but would separate the genus from *Fayolia*, which he regarded as representing fish-remains. The spine-scars and spiral ribs are poorly preserved. The latter form an angle of about 30 degrees. Like *F. sterzeliana*, it is very slightly compressed but approximately cylindrical, but it is larger, measuring 17 cm. long by 4 cm. broad, and, whereas *F. sterzeliana* bears on the valves fine striations parallel to the sutures of the valves, in *F. palatina* these are absent. The presence of striæ and the absence of tapering ends, however, cannot be regarded as of specific importance. Cylindrical specimens were compared with portions of stems, the scars being regarded as representing the points of attachment of leaves, but they are no doubt, merely incomplete specimens, while the ornamentation on the surface of the valves is in all probability not an original feature, but is due to the various processes of mineralisation. Such was found to be the case in the related genus *Palæoxyris*.[1]

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[1] Renault, B., and Zeiller, R., *op. cit.*, 1888, p. 28, Pl. LXII., fig. 3-5.

[2] Weiss, C. E., *Abh. Geol. Specialkarte von Preussen und den Thüringischen Staaten*, Band I., heft ii., 1884, pp. 152, 202, Pl. IV., figs. 3, 4.

F. grandis is markedly larger than *F. dentata*, and is further distinguished from that species by the absence of the dentations in the collarette.

FAYOLIA CRENULATA Moysey.

Plate VIII., figs. 2 and 3.

Two examples of this large species were found by Moysey in the Top Hard Coal (Yorkian Series) at Shipley Manor Claypit, near Ilkeston, Derbyshire. These specimens are now in the Museum of Practical Geology. They are in a fragmentary state, the portions being numbered 11,135, 11,134, 24,518, 24,519, 24,520, 24,521, while there is a piece in the Kidston Collection (Nos. 4149, 4150). The best specimen, which was figured by Moysey (*op. cit.*, pl. xxvi., f. 3; pl. xxvii., f. 1), is No. 11,134. It is described as a gradually tapering flattened cylinder, 5·6 cm. wide at one end, and 4·5 cm. at the other. The length of the specimen preserved is 11 cm., but neither termination is shown. The fossil is composed of two finely striated valves, 2·1 cm. across. These valves are fused by their margins, and two and a half turns of the spiral are represented. Both fine and coarse striæ ornament the valves. The margin of the collarette, which is 12·75-15 mm. wide, is crenulate (hence the specific name), and shows a double contour. The spine scars are 2 mm. in diameter, and are situated 4·6 mm. apart, so that ten scars occupy 38 mm.

Moysey suggested that the double crenulate margin of the collarette indicated the presence of a second, and probably more delicate, collarette 'pierced by or possibly carrying the spines.' Pruvost, however, pointed out that this superposition of membranes is due to the two successive valves attaching to each other at this point, probably by means of the spines, which, being inserted in the lower edge of one valve, hook across the perforations of the adjacent valve. *F. crenulata* shows a fair resemblance to *F. grandis* in the size and arrangement of the spine-scars, as well as in the size of the collarette, but is separated from it by the comparative coarseness of the striations on the valves, by the crenulate margin of the collarette, and by the greater dimensions of the specimens. Of these characters, the most distinctive is the crenulation of the collarette.

(*To be continued*).

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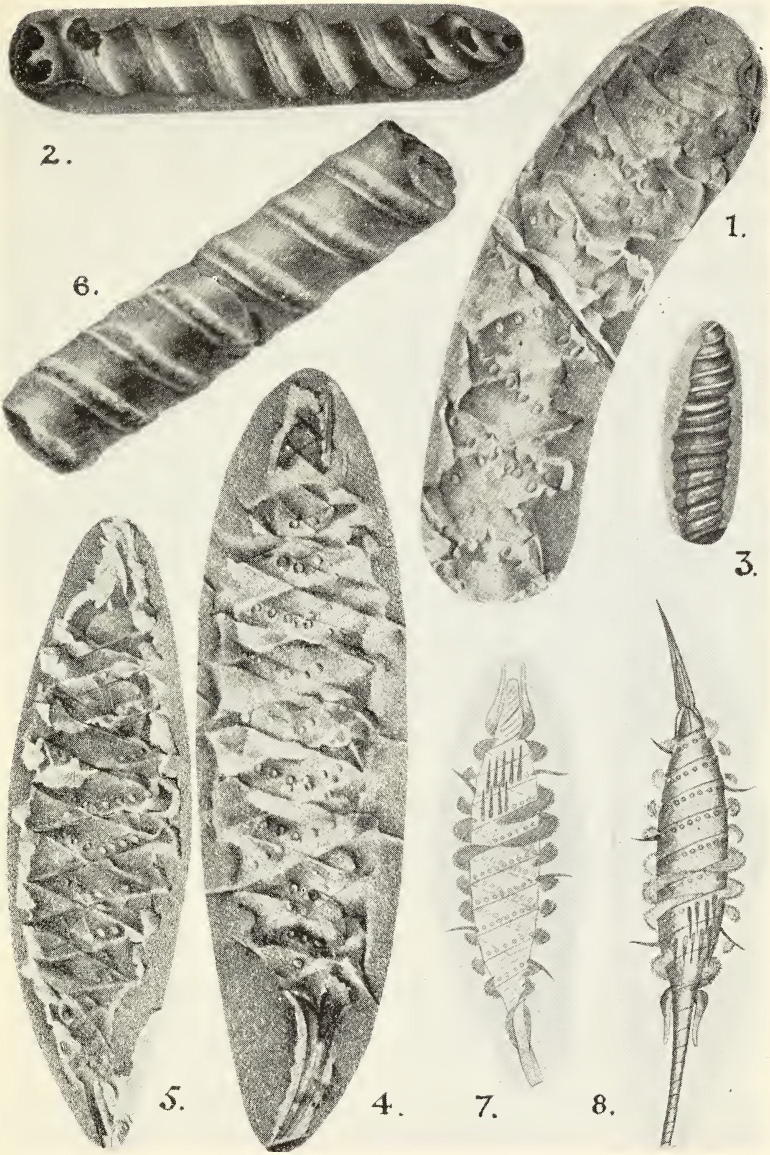
[1] See Crookall, R., *op. cit.*, p. 87. These striations have been compared with those on the egg-cases of fishes.



Fayolia.

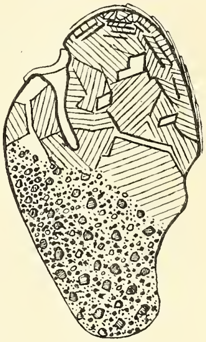
THE COMPOSITION OF CERTAIN FOSSILS FROM BLEA WYKE.

SIDNEY MELMORE, B.Sc., F.G.S.

AMONG the fossils of the Blea Wyke Beds the small *Terebratulæ* found in the lower sandstone stand out conspicuously, their dark brown to black colour contrasting sharply with the grey colour of the matrix.

The septarian doggers at the top of the Lower Lias often contain zinc-blende, and, judging from the colour alone, it was at first thought that the Blea Wyke fossils might also be composed of the same mineral.

A specimen of Terebratula was taken, and a thin section prepared, passing through the median plane from the beak to the margin. The calcite of the shell-walls is colourless, and the imbricated arrangement of the constituent plates is well shown, particularly on the ventral valve. Colourless calcite also envelops the outside of the foramen, and extends inwards for a short distance, replacing the part formerly occupied by the peduncle.



The apical end of the shell is filled with clear, transparent, yellowish-brown matter. In polarised light this is seen to be made up of crystals, which, near the umbo of the ventral valve, become tabular in form, and arranged parallel to the surface of the shell. The marginal half is filled with sand cemented with the same brown mineral. The structure is shown diagrammatically in the accompanying figure. The crystals are uniformly coloured, and are faintly pleochroic in shades of yellowish-brown. Absorption O > E. The higher refractive index of the material in yellow light was found to be exactly equal to that of monobromnaphthalene. The index of the sample of liquid used was determined on the refractometer and found to be 1.66, agreeing with the index ω in calcite.

The specific gravity was determined by immersing pieces of pure calcite, dolomite, and a fragment of the mineral, in Sonstadt's solution. The solution was diluted in successive stages, and it was found that the mineral was decidedly lighter than dolomite, and only very slightly heavier than calcite. The specific gravity may therefore be taken as 2.73.

The mineral is completely soluble with effervescence in cold hydrochloric acid, and addition of ammonia in excess yields a small precipitate of iron.

Thus the mineral occupying the body of the fossil is clearly calcite, coloured brown by iron. It is evident from the refractive index that the iron is not in the form of chalybite, and as the calcite gives off water on heating it is no doubt present as an hydrated oxide.

G. Steinmann* has observed that calcium carbonate is precipitated from saturated solutions in the presence of decomposing albuminoids owing to the formation of ammonium carbonate by fermentation. The calcite in the body-cavity of these Terebratulæ can be explained in this way, and the idea is supported by the fact that it is found free from sand only at the apical end of the cavity, where the body of the animal would shrink after death.

The iron was perhaps secreted by the animal during life.

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NEWS FROM THE PRESS.

The Evening News for October 13th informs its readers that a Japanese savant has come upon a fossilised lobster 4,000,000 years old. The discovery, he says, will solve several geological problems. It may elucidate one problem that still baffles the archæologists. There is evidence that the lobster is cœval with civilisation. It has yet to be disproved that civilisation is cœval with the lobster. It is reasonable to suppose that where the lobster was there were gathered together a fortunate band, Mousterians or Chelleans or what you will, who could claim, if they had thought of it, to be the intelligentsia of their age.

A correspondent in *The Hull Times* writes : ‘ I am a keen collector of insects and reptiles, being a collector for thirty years, often having reports in the press. Only recently I was spending a few days at Easington, Kilnsea and Spurn, looking for fresh specimens to add to my collection. At Easter, while searching amongst the pebbles near Easington and Kilnsea, I found a rare fossil (Sea Urchin) on the shore just on the high water line. I have a large collection of shells, fossils, sponges, bird eggs, butterflies, moths, beetles, spiders, scorpions, centepedes, millepedes, lizards, snakes, iguanas ; also fossils, minerals and precious stones, Jasper agates, jet, amber, gold quartz, silver quartz, etc. I am a constant reader of your paper, as a kind friend sends me it every week. Hoping this information will be of use to you.’

The papers on October 19th tell us that : ‘ Emlyn Roberts (aged 15), son of Mr. and Mrs. Robert W. Roberts, Llys Twrog, Maentwrog, Merioneth, who is a student at the Blaenau Festiniog County School, shows a remarkable talent in the finding of water by holding an ordinary hazel rod cut from the woods. By special request he attended a farm in the neighbourhood known as Penbryn-pwll-du, where the farmer was in need of water for household needs and for his animals. While walking through the field Roberts suddenly stopped, when the hazel rod bent to the ground of its own accord. The lad told the farmer : “ There is water to be had there,” which proved to be true. The same rod was tried at the same places by several other persons, but without avail. The boy is a grandson of the late well-known Wesleyan preacher, Mr. William Roberts, of Maentwrog.’

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* F. W. Clarke, ‘ Data of Geochemistry,’ ed. 3 (1916), p. 551.

AMMONITES FROM THE YORKSHIRE CHALK.

W. C. ENNIS, B.Sc.

During the August meeting of the Yorkshire Geological Society in the Malton area, two ammonites were collected from the chalk by Mr. T. Stainforth, B.A., B.Sc. They were submitted to Dr. L. F. Spath, of the British Museum, who promptly identified both.

The first was found in a pit on the road from North Grimston to Wharram. At the top of the quarry is the lower chalk of the *Holaster subglobosus* zone. Under it is the red chalk (here nearly yellow), and the gritty bed which represents the Carstone, followed by blue clay. The ammonite occurred in the yellow chalk, was about 2½ inches in diameter, and was fairly well preserved. Dr. Spath identified it as *Schlœnbachia glabra* (Spath), and says it is the same species as *Amm.* '*goupilianus*' of Sharpe. It belongs to the *varians* zone.

The other specimen, which is about an inch in diameter, was found in a fallen block of white chalk in the long cutting at Wharram station. Dr. Spath recognises it as a young example of *Pachydiscus sharpei* (Spath), and considers it most probably came from the zone of *T. gracilis* (*T. lata*), or the *Holaster planus* zone. As the black band occurs fairly high in the section, the first of these appears to be the more probable.

On a previous visit to this cutting, a large ammonite about two feet in diameter was seen on the floor of the pit, where it had been left by the workmen.

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We have the *Annual Report of the Salisbury, South Wilts. and Blackmore Museum* for 1927-8, which contains a very creditable list of additions to the collections there.

We have received the *Second Annual Report of the Curator of the Museum and Art Gallery, Wakefield*, which contains a list of additions which have been made to the collection from time to time.

The Reports of H.M. Inspectors of Mines for the Year 1927, No. 2 North Division, Report by Mr. T. Greenland Davies (H.M. Stationery Office, 70 pp.), is sold at the small price of 1/- net, and doubtless this is possibly due to the fact that a large number of advertisements appear.

We have been favoured with a reprint of a paper in *The Journal of the Royal Microscopical Society*, on 'The Pegididæ, a New Family of Foraminifera,' by E. Heron-Allen and Arthur Earland. There are many excellent illustrations, and the new species represent the result of investigations of material from Portuguese East Africa.

The Halifax Scientific Society favours us with a copy of its syllabus. The 1928-9 session started on October 3rd, when Dr. Woodhead gave a paper on the 'Yellowstone National Park.' Messrs. Versey, Waterworth, Rhodes, Chislett, Mosley, Kendall, Hamilton Thompson, Carline, Wager, and others, are assisting in what must be a particularly successful session.

GOMPHIDIUS VISCIDUS: AN ESCULENT FUNGUS.

A. E. PECK.

ALTHOUGH I have long known this fungus to be described in the text-books as 'edible,' I have no recollection of having tried it in the past.

In September last, however, I gathered about ten nice specimens, in its usual habitat, a coniferous wood, and decided to test their merits, first consulting my authors and reading as follows:—M. C. Cooke (Handbook) 'Esculent'; (Catalogue), 'Edible.' C. Rea (British Basidiomycetæ), 'Edible, indigestible to some.' Massee, no reference to its edible qualities. Worthington G. Smith, 'said to be edible,' but continues: 'Every intermediate form occurs between this and *Gomphidius glutinosus* Fr., of which species he writes: 'Said to be edible. Eaten at Hereford Fungus Forays, but not much approved, 1870. Taste watery, mouldy.'

The stem of this highly coloured fungus is decidedly firm and might dispose some persons to reject it as possibly indigestible, as described by Rea.

My wife cooked them in a super-heated steam vessel, and I was surprised when they were turned out, to see that they were of a rich beetroot colour. They were perfectly tender, of a very agreeable sweet flavour which reminded me of beetroot or boiled red cabbage. Although I began with hesitation, I finished with confidence and appreciation. I never ate a simpler meal, more easy of digestion, so that I can confidently recommend them as a safe, tasty and easily digestible dish. I think that Worthington Smith's word 'Mouldy' is significant. With age, this fungus does develop a peculiar, dry, green mould upon its gills, and I suspect that his friends had experimented with it in this condition.

On the same day, at a previous meal, I had had a nice plate of *Coprinus atramentarius* in the youngish state, which I found to be perfectly satisfactory in every way.

The high colour of *G. viscidus* may be appreciated by the following description—I quote W. G. Smith: 'Pileus becoming flat, rich apricot, shaded vermilion, sometimes brick-red, often mottled dark purple, Stem, solid, orange, pale purplish above. Gills olive, then crimson-purple, purplish or whitish-purple. Flesh, yellowish, often with purple stains, rhubarb-colour at base.'

I cannot think of another fungus to which such a profusion of colour could be ascribed. It grows up to 6 in. high, pileus 2 to 3 in. diameter, and stem ½-¾ in. thick. Gregarious and not uncommon in pine woods.

MUSEUMS AND MONEY.*

T. SHEPPARD, M.Sc.

Ostensibly, Mr. Harold Cox's contribution in the *Sunday Times* for September 23rd had for its object an appeal that funds for our National and Provincial Museums should be obtained by making a charge for admission. This old-fashioned and obsolete argument appears at a time when greater interest is being taken in Museums and our national treasures than has ever been shown previously. Anyone would assume from Mr. Harold Cox's arguments that he was bringing forth something new. As a matter of fact, a century ago such collections as were called Museums were maintained by charges for admission ; quite a large number of them were admittedly collections of ' curios ' drawn from many lands, largely to awe and puzzle the visitor. Similarly, a century ago, when the Literary and Philosophical Societies were formed, and with them their Museums, the same idea was rampant, and a charge for admission was made, a feature which still exists in a very few institutions up and down the country which have not kept abreast with the times, or which have not taken others steps to have an adequate income. Most of these institutions, quite properly, have been handed over to the care of the municipalities, and in this way have received adequate attention and have proved to be educational in many ways, rather than awe-inspiring. It is admitted that in one or two instances, in London, a charge is made on certain dates, but obviously it is for the benefit of the students in these very few places, who find material worth the pains of copying, and presumably the charge is made to prevent the crowds, which usually appear, interfering with their work. In my own opinion, however, this difficulty could be avoided and the *owners* of the pictures, namely the public, still be permitted to see their treasures when they wished, by leaving one or two rooms which might be set apart alternately for the benefit of artists requiring to copy, or make designs.

Unquestionably, the whole object of a museum is to enlighten, to instruct, to educate and to inspire, not only the student, but the ' average visitor.' What Mr. Harold Cox, in his old-fashioned way, seems to forget is that the contents of our museums belong to the people who come to visit them. They have either paid for them, or, as he admits, generous benefactors have given valuable collections for the benefit of the public to the government or the municipalities, or to the societies who are holding these valuable gifts, and they should see that the persons for whom they are intended should have unlimited access. Why, in these days, should the school children, or the children of working men, or even the people out of work (and there are a large number of them) be debarred from seeing the collections which are theirs. To make a charge of 6d. or 1/- might in some cases add to the income of an institution, but it would certainly prevent large numbers of people, who have every right to view them, from seeing the exhibitions. Charge for admission defeats the entire purpose of a museum or art gallery by selecting a certain section of the community as visitors, a section which is not so much in need of inspiration and instruction as those who are kept out.

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* *The Sunday Times*, having expressed very one-sided opinions on the above subject, was replied to by a past-president of the Museums Association, but as that paper cannot find room for the other side of the question, he replies to the criticisms here.—Ed.

Under the head of ' Museums and Money,' Mr. Harold Cox gives his opinion on the cost of elementary education, and suggests that a charge should be made as was the case many years ago. Personally, we think those in whose hands the education of our children lies are as capable of forming an opinion on the matter as is Mr. Harold Cox, and in any case, it is not likely that his opinion will cause many resignations in the Education Committees up and down the country, but it is difficult to see what that has to do with charging for admission to museums.

Mr. Cox tells us that in his opinion the Cabinet is too large, and should be reduced in numbers. Notwithstanding this opinion, it is unlikely that the Government or anyone else will take any steps to reduce the Cabinet. Still again it is difficult to see what this has to do with the question of charging for admission to museums. The same may be said of Mr. Harold Cox's opinion on the unemployment allowance, and on those maintained by the Poor Law. What we are more concerned with, however, is the subject mentioned in the title of this article.

Mr. Harold Cox does not mention Public Libraries. Surely they are very much on the same lines as museums, and he might argue that because the Times Book Club, or big Store Chemists, and many large booksellers have libraries for which a charge is made, that therefore our Public Libraries should be closed to all except those who pay for admission, or for the loan of the books used. The obvious reply is that as the Public Library is paid for by the public, it has a right to use the books. This would probably be Mr. Harold Cox's reply, and is probably the reason he has not referred to Public Libraries in his article, but surely precisely the same arguments obtain with regard to museums and art galleries? To suggest that payment should be made for every book borrowed from a public library would cause an outcry that even Mr. Harold

Cox could not subdue. It would also interfere with the education of the people using libraries, and our libraries are not merely receptacles for shelves-full of light reading for people who have time on their hands and wish pleasantly to pass it away. The library in most cases is just as much of value to the historian, artist, architect, student of science, and so on, as is a museum. The reference rooms in public libraries contain many valuable treasures, which are handled and used with the same care as are museum specimens. In addition, what librarian is there who has not some early form of printing or illuminated manuscript or other gem which he keeps, for the benefit of the public, and regards with the same respect as the director of a museum does the specimens under his charge ?

The recent report of the Royal Commission has shown that the public demands better access to the treasures which belong to the public. The report indicates that sufficient financial assistance is not given to enable the work adequately to be carried out. Most of those who read the report and are interested in the question must admit that in many cases the Government and Municipalities do not appreciate the value of the work accomplished by museums and art galleries, and do not even appreciate the value of the gifts made by people to be housed in these buildings. They are prepared to say 'thank you' for a valuable collection of china, pottery, sculpture, numismatics, natural history, geological or other specimens, but in many cases are not prepared to go to the expense of enabling these collections to be viewed. It is up to the public to show they are sufficiently interested in the value of museums to insist that they shall be properly staffed, and in many cases this has been demonstrated by the great variety of museums which are springing up all over the country, and by the costly museums and galleries which have recently been built and are still being built in all parts.

P.S.—Since the above was written, the announcement has been made that Sir Joseph Duveen, a native of Hull, will provide the necessary funds for the suggested extension of the National Gallery and other galleries in London, the condition being that the Government or someone else provides the necessary funds for the expenditure on museums, as recommended by the Royal Commission. This means either that the conditions will have to be accepted in which case the Commission's recommendations will be carried out, of if not, the art galleries will suffer considerably. Personally, we consider that there is no question but that the Government will adequately deal with the museum question, and consequently Mr. Harold Cox's suggestion of charging for admission will be all the more unnecessary.

1928 Nov. 1

FIELD NOTES.

Goniodiscus rotundatus (Müll.) sinistrorsum.—J. W. Jackson (*Journ. of Conch.*, 1903, p. 284) says: 'It is surprising that, considering the vast numbers of this species throughout Europe, so few sinistral examples have been found.' J. W. Taylor (*Monogr. of Brit. Land and Freshw. Moll.*, 3, 1914, p. 191) gives the following records:—*Middlesex*: In garden, Burlington Lane, Chiswick, October, 1895, A. Sich. *Bucks.*: Among dead leaves, Burnham Beeches, July, 1908, J. E. Cooper. *Derby*: Castleton, May, 1902, J. W. Jackson. *Down*: Aghadery Glebe, Loughbrickland, August, 1888, C. H. T. Lett. *Thuringia*: A fossil specimen found by Dr. Loretz in tufaceous limestone near Weissenbrunn, Coburg (O. Boettger, 1.c.). I am now able to give two further records of reversed specimens to the list. A. C. Johansen and H. Lynge (*Meddelelser fra Dansk geol. For.*, 5, 1917, 11, p. 17) found a specimen in the Holocene deposits at Strandgaard, near Kalundborg, W. Zealand, Denmark, and H. Lohmander (in L. A. Jägerskiöld's *Göteborgtraktens Djurvärld*, 1923, p. 440) give a specimen from Slottsskogen near Göteborg, Sweden.—Hans Schlesch.

Perch prolific in a Yorkshire Lake.—In a private lake, near to Ben Rhydding, it has been decided to reduce the numbers of Perch in the interest of the few Trout that are present, when more Trout will be put in. This lake is about 250 yards long and about 60 yards wide. It is very shallow—I should say that it will not average three feet in depth—in fact I have seen a Heron walking over quite the half of it. It is silted up, and there are large patches of weed at the bottom, and although the water is clear, it is not possible to see a fish of any kind during the day; at least I have never been able to see one. Yet in five evenings in August, and with only two rods (one each time held by Mr. Richardson, station-master at Ben Rhydding—a great angler), and fishing two to three hours each time, they caught the incredible number of exactly 150 Perch in all! I know that it sounds like a 'fish tale,' but on three of the evenings I was present, and counted the fish. If the cast were thrown far enough out the worm was usually taken before it reached the bottom, while nearer to the side and shallower, it might remain for a few minutes before being swallowed. Considerably more time was taken in unhooking them than in hooking them. In view of the numbers present the fish were in splendid condition and put up very good fights. They would average about three to the pound. Eight of the larger ones I took home weighed just over 4 lbs. together. By the next morning they were as stiff and as hard as boards. We had them cleaned and steamed, and I liked them. Each member of my family liked the flesh at the first, but before long they got so inextricably mixed up with bones and scales, etc., that nothing could induce them to attempt another one. Mr. Richardson for the most part boiled his, and gave them to his fowls! Worms were the chief bait used, but spun Minnows (preserved in formalin) were responsible for a few. This bait was used in the hope of catching some of the large Tench, which also occupy this lake. Although we could see them rolling near the surface of the water, or to be more accurate, we could see the agitation of the water as they rolled, in the declining light; yet we were not successful in securing a single Tench. The numbers and excellent condition of the fish speaks wonders for the 'feed' in the lake, and coming into the lake. The numbers completely surprised me, because I have hidden and watched a Heron stalking about this lake, and not catching more than one fish in a quarter of an hour; in fact, missing two or three strikes to every successful one. But he probably found what we had learned, viz., that nearly all the fish were where the water was rather too deep for him. And Mr. Richardson calmly tells me that we have not reduced the numbers there at all, or very little.—H. B. Booth.

Migrant Butterflies and Hawk Moths.—On June 23rd, worn and battered migrants of the Painted Lady butterfly were common along the cliffs south of Withernsea, visiting thistle plants presumably for oviposition; and on various dates, for two or three weeks later, sporadic examples were to be seen in Holderness, both inland and on the Humber shore near Hull. In September the newly emerged offspring of these aliens have been abundant, particularly on the Humber shore. A fortnight ago I was able, during a Nature Study lesson, near Marfleet, to point out a swarm of about twenty of these butterflies flitting about or sipping nectar from the flowers of a sheltered patch of Sea Aster. The picture was an exquisite one. The Vanessid butterflies are strangely attracted by our halophytic 'Michaelmas Daisy,' and during the present autumn Red Admiral and Small Tortoiseshell butterflies have been seen commonly, and Peacock butterflies rarely, feasting upon its flowers in the neighbourhood of Hull. On September 9th I noticed examples of the Clouded Yellow butterfly at Spurn, one being caught by Mr. H. Pickard. A few days later my son caught a specimen on the Humber shore at Hessle, and on several occasions during the month I have pointed out single examples flying among the Sea Aster, to students on outdoor lessons near the Humber to the east of Hull. The last year in which I observed the Clouded Yellow in the Hull district was 1922, and I have by me a specimen caught on the Humber shore east of the city in September of that year. Several were seen on the occasion of the visit of the Botanical Section of the British Association to Elloughton Dale in the same year. Whether it be owing to immigration or not I cannot say, but the commonness of the Large Elephant Hawk moth in the Hull area has been very noticeable during 1927 and 1928. This year caterpillars occur wherever masses of the Rose Bay Willow Herb flourish on waste ground, particularly in the neighbourhood of the Hull docks. I have also found the caterpillar recently in the chalk dales and on the sandy heaths of 'Derwentland.' In a Holderness locality I found early in September about twenty caterpillars of the Humming Bird Hawk moth feeding upon Yellow Bedstraw. These may also possibly be the offspring of migrant parents.—T. Stainforth, Hull.

Clouded Yellow Butterfly in Holderness.—A rare visitor, the Clouded Yellow Butterfly, has made its appearance on the Holderness coast during the first fortnight of September. Three specimens have been seen, all of them on the coast, from which it is fair to presume that they have recently arrived from overseas. The Painted Lady is also well distributed, and as it was almost non-existent in East Yorkshire last season, apparently the large immigration of this species observed in the south counties has reached us.—E. W. Wade.

Fungi on the 'Bonnie Banks of Loch Lomond.'—In connection with my report of the recent Fungus Foray at Sledmere (which terminated on August 30th), the following account of my experience on September 8th may not be without interest. I had been at the Glasgow Meeting of the British Association, and on the day named took part in an excursion to Loch Lomond. We landed at Inversnaid, and walked to Loch Arklet and back, a distance of four miles in the two hours at our disposal. Fungus hunting was therefore out of the question, but in the small, damp, for the most part moss-covered woodland near the waterfall, and later by the roadside, I picked up the following: *Amanita muscaria* (under a Birch), *Amanitopsis nivea, Lepiota granulosa, Omphalia* sp., *Clitocybe* sp., *Laccaria laccata, Lactarius glyciosmus, L. rufus, Russula nigricans, R. fragilis, Cantharellus cibarius* (rather numerous), *Hygrophorus* sp., *Inocybe* sp., *Entoloma sericeum, Cortinarius elatior, Boletus scaber, Hydnum repandum, Polystictus* sp. A few days later I saw in a Scottish wood by a river side the delectable *Lactarius deliciosus*. The interest in this list lies in the fact that, with the exception of *Entoloma sericeum*, a very common species, not one in this list was seen at Sledmere.—A. E. Peck.

YORKSHIRE NATURALISTS AT RICHMOND.

F. A. MASON, F.R.M.S., AND J. M. BROWN, B.Sc., F.L.S.

(*Continued from page* 281).

MYCOLOGY.—In Whitcliffe Woods the undergrowth consisted too largely of Bramble to lead the mycologist to expect much in the way of fungi. The Bramble itself, however, was freely attacked by a Uredine, *Phragmidium rubi* Wint., and in many cases the stems, in addition to the leaves, were producing abundant cæomata ; there is no previous record of the occurrence of this species in the N.W. Division. Other uredines collected were *Uromyces acetosa, U. dactylidis, U. poæ, Puccinia centaurœa, P. hypochæridis, P. variabilis* and *P. taraxaci*. Seedling Birches were infected with *Melampsoridium betulinum* Kleb., and the Oak with the conidial form of *Microsphæra alphitoides* Griff. et Maub. ; *Rhytisma acerinum* was rampant on Sycamore.

Several mildews occurred as follows :

Plasmopora pusilla Schroet. On *Geranium sylvaticum.*
P. densa Schroet. On *Euphrasia.*
Peronospora violacea Berk. On petals of *Scabiosa arvensis.*
P. schleideni. On *Allium.*
P. ficariæ. On *R. repens.*
Sphærotheca pannosa. On *Rosa* sp.
Erysiple graminis. On various grasses.

Aske Park and Black Plantation proved to be rather better ground for fungi. *Lactarius rufus, Russula ochraleuca, R. xerampelina* and *Amanita rubescens* were the more commonly occurring species in Aske Park, with *Mycena rugosa, M. galopus, M. galericulata* and *Marasmius hariolorum.* Other hymenomycetes observed were *Omphalia fibula, Mycena hæmatopus, Lactarius turpis, Paxillus involutus, Boletus scaber, B. elegans, Fomes annosus* and *Polyporus squamosus.* The latter species was far too abundant for the good of the trees in the neighbourhood, and prolific as it often appears one rarely sees such a display of this fungus as was seen on recently-felled trunks lying in the lumber-yard adjoining Aske Plantation. The most interesting species met with was a polypore, *Polyporus epileucus,* on Oak, in Sedbury Park, which attracted the attention of Mr. Burgess and the writer during the drive out to Aske. The species is characterised by its cream-coloured appearance and the peculiar cheesy consistency of its substance ; it is an addition to the fungi of N.W. Division.

Several microscopic fungi were noted among the herbage alongside Aske Beck, among which were :

Plasmopara epilobii. On *E. montanum.*
Peronospora violæ. On *V. riviniana.*
Microsphæra grossulariæ. On *Ribes alpinum.*
Erysiple galeopsidis. On *Stachys.*
E. polygoni. On *Circææ lutetiana.*
Puccinia leontodonis. On *L. autumnale.*
P. prenanthis. On *Lactuca muralis.*

On dung : *Cheilymenia coprinaria, Coprobia granulata, Mucor mucedo, Pilobolus kleinii, Coprinius niveus* and *C. lagopus.*

Brignall Banks, a locality that has proved on several occasions in the past to be good collecting ground, was very dry, and few agarics were seen. *Pleurotus ostreatus, Pluteus cervinus, Galera tenera* and *G. hypnorum,* with troops of *Hypholoma fasciculare* were seen. *Polyporus hispidus* occurred on Ash, and the latter was badly attacked by canker, *Nectria ditissima.* A parasite not seen in the other districts visited was *ustilago hordei.*

FUNGUS GALLS.—Mr. J. M. Brown collected *Urocystis anemones* on *Ranunculus repens* at Whitcliffe Woods, *Synchytrium anemones* on the same host, and *Epichloe typhina* on *Holcus mollis*, both at Aske, and *Synchytrium mercurialis* at Brignall Banks.

A decided galling effect accompanied by severe gummosis, was observed on branches of Wild Cherry (*P. avium*), Brignall Banks, but whether the causal agent is a bacterium or a fungus has not been determined.

ENTOMOLOGY (J. M. Brown).—The area investigated during the excursion was eminently suitable for entomological collecting, including as it did such diverse country as Whitcliffe Woods, Aske Beck, Black Plantation, with a stretch of moorland beyond, Jockey-Cap Hill and the Brignall Banks by the Greta, while the Park at Darlington, though not included in the county, gave opportunities nearer headquarters. Such varied country might well be expected to yield many insects of particular interest, but this promise was not fulfilled, for though considerable industry was displayed and numerous species of several orders were taken, few proved to be of special rarity. During the greater part of the time the recorder devoted most attention to the Hemiptera, the Psocoptera and the Neuroptera, and after being joined by Mr. M. L. Thompson on the Monday, the Coleoptera were included. These, however, seemed anything but plentiful. One capture of some interest was the small earwig, *Labia minor*, which I took in the Darlington Park on the Friday afternoon, and again at Aske on the Monday. Though not new to either county there are very few records of it published.

Whitcliffe Woods, which consist mainly of Oak, with Sycamore, Ash, Elm and some Fir, and nearer the river, Sallow, presented considerable difficulty in working owing to the very dense undergrowth of bramble which occupied a large part of the wood, but where beating and sweeping could be resorted to, yielded the insects commonly associated with this mixed type of woodland, though a number of very characteristic oak-loving Hemiptera seemed to be absent. The species met with included :

HETEROPTERA.

Anthocoris nemorum L.
A. confusus Reut.
A. nemoralis F.
Phytocoris longipennis Flor.
Calocoris sexguttatus F.
C. norvegicus Gmel.
Lygus pabulinus L.
L. cervinus H. S.
L. viridis Fall.
Monalocoris filicis L.
Bryocoris pteridis Fall.
Stenodema holsatum F.
Dicyphus stachydis Reut.
Cyllocoris histrionicus L.
Mecomma ambulans Fall.
Phylus palliceps Fab.
P. melanocephalus L.
P. coryli var. *avellanæ* Mey.
Psallus variabilis Fall.
P. alnicola D. & S.
P. varians H. S.
Atractotomus magnicornis Fall.
Plagiognathus arbustorum F.
P. chrysanthemi Wolff.
Asciodema obsoletum D. & S.

And by the river side :

Salda saltatoria L.
S. c-album Fieb.
S. scotica Curt.

HOMOPTERA.

Philænus spumarius f. *lineatus* Fab.
Aphrophora alni Fall.
Euacanthus interruptus L.
Batracomorphus lanio L.
Idiocerus lituratus Fall.
Idiocerus confusus Flor.
Acocephalus nervosus Schr.
A. albifrons L.
Jassus mixtus Fab.
Thamnotettix prasinus Fall.
Cicadula 7-notata Fall.
Alebra albostriella Fall.
Eupteryx signatipennis Boh.
E. pulchella Fall.
E. concinna Germ.
Typhlocyba quercus Fab.
T. nitidula Fab.

Typhlocyba geometrica Schr.
Zygina alneti Dahl.
Psyllopsis fraxini L.
Psylla peregrina Först.
P. mali Schm.
Trioza urticæ L.
Cixius brachycranus Scott.

Neuroptera.

Coniopteryx tineiformis Curt. Beaten from Holly.

Psocoptera.

Graphopsocus cruciatus L.
Stenopsocus immaculatus Steph.
Cæcilius flavidus Steph.
Peripsocus phæopterus Steph.
Elipsocus hyalinus Steph.
E. cyanops Rost.
E. westwoodi McL.

Brignall Banks and the woods and pastures by the Greta, being more varied in character, yielded a greater variety of species, and, largely owing to the more open character of the ground flora, gave greater opportunity for sweeping, but unfortunately the most promising portion had to be passed over rather hurriedly. A banded burying beetle, *Necrophorus investigator* Zett. was taken near the chapel ruins.

Heteroptera.

Temnostethus pusillus H. S.
Anthocoris nemorum L.
Phytocoris tiliæ F.
Calocoris norvegicus Gmel.
Bryocoris pteridis Fall.
Lygus pabulinus L.
L. viridis Fall.
L. contaminatus Fall.
L. rubricatus Fall.
Dicyphus stachydis Reut.
Cyllocoris histrionicus L.
C. flavoquadrimaculatus DeG.
Mecomma ambulans Fall.
Orthotylus viridinervis Kb.
Phylus palliceps Fieb.
Psallus ambiguus Fall.
P. alnicola D. S.
Atractotomus magnicornis Fall.
Plagiognathus chrysanthemi Wolff.

Homoptera.

Philænus spumarius L.
P. lineatus L.
Aphrophora alni Fall.
Euacanthus interruptus L.
E. acuminatus Fab.
Oncopsis alni Sch.
Athysanus plebejus Fall.
A. obsoletus Kbm.
Deltocephalus distinguendus Flor.
D. punctum Flor.
D. pascuellus Fall.
D. pulicaris Fall.
Limotettix sulphurella Zett.
Cicadula 6-notata Fall.
Alebra albostriella Fall.
Empoasca smaragdula Fall.
Eupteryx notatus Curt.
E. stachydearum Hdy.
E. atropunctatus Goeze.
E. pulchellus Fall.
E. concinna Germ.
Typhlocyba ulmi L.
Kelisia vittipennis Sahl.
Conomelus limbatus Fal.
Dicranotropis hamata Boh.
Psylla alni L.
Trioza urticæ L.

Psocoptera.

Amphigerontia bifasciata Latr.
Graphopsocus cruciatus L.
Reuterella helvimacula End.
Cæcilius flavidus Steph.
C. burmeisteri Bra.
C. obsoletus Steph.
Elipsocus Hyalinus Steph.
E. westwoodi McL.
Philotarsus flaviceps Steph.

Orthoptera.

Stenobothrus viridulus L.

Black Plantation, consisting largely of Scots Fir and related conifers, with some Birch and other deciduous trees, and with a ground flora of bracken and other ferns, yielded a more compact assemblage of insects.

Those associated with the trees :

Heteroptera.

Tetraphleps bicuspis H. S.
Microphysa pselaphiformis Curt.
Camptozygum pinastri Fall.
Atractotomus magnicornis Fall.

HOMOPTERA.

Eupteryx germari Zett.

PSOCOPTERA.

Amphigerontia bifasciata Latr.
Graphopsocus cruciatus L.
Stenopsocus immaculatus Steph.
Cæcilius flavidus Steph.
C. burmeisteri Br.
Peripsocus phæopterus Steph.
Mesopsocus unipunctatus Mull.
Elipsocus cyanops Rost.
E. westwoodi McL.
E. hyalinus Steph.

NEUROPTERA.

Hemerobius stigma Steph.

COLLEMBOLA.

Entomobrya albocincta Templ.
E. nivalis L.

Those associated with the ground flora :

HETEROPTERA.

Trigonotylus ruficornis Geoff.
Miris ferrugatus Fall.
Bryocoris pteridis Fall.
Monalocoris filicis L.

HOMOPTERA.

Philænus spumarius L.
Euacanthus interruptus L.
E. acuminatus Fab.
Deltocephalus distinguendus Flor.
D. pulicaris Fall.
Eupteryx auratus L.

A short search beneath the heather on the moorland beyond the plantation during the halt for lunch yielded *Orthotylus ericetorum* Fall. *Ulopa reticulata* Fab., *Acocephalus bifasciatus* Fall. among the Hemiptera ; *Entomobrya nivalis* L. and *Lepidocyrtus languinosus* Gmel. and *L. cyaneus* Tullb. among the Collembola.

Jockey Cap Hill, largely grassland, yielded species usually found in such places ; *Pithanus mærkeli* H. S., *Stenodema holsatum* F., *Miris ferrugatus* Fall. among the Heteroptera ; *Acocephalus nervosus* Sch., *Deltocephalus distinguendus* Flor., *D. abdominalis* Fab., *D. pascuellus* Fall., *D. punctum* Flor., *D. pulicaris* Fall. among the Homoptera, and on the Hawthorns at the summit, *Psylla peregrina* Frst.

The rather hurried walk down Aske Glen gave some opportunity for collecting among the damp vegetation, and beating the Alders and Sallows by the stream-side, where the following were taken :

HETEROPTERA.

Anthocoris nemorum L.
Calocoris norvegicus Gmel.
Lygus pabulinus L.
L. viridis Fall.
Stenodema holsatum F.
Miris dolobratus L.
M. ferrugatus Fall.
Dicyphus stachydis Reut.
Mecomma ambulans Fall.

HOMOPTERA.

Philænus spumarius f. *lineatus* Fab.
P. spumarius f. *lateralis* L.
P. spumarius f. *leucocephalus* Germ.
P. spumarius f. *populi* Fab.
Aphrophora alni Fall.
Euacanthus interruptus L.
Oncopsis flavicollis L.
O. rufusculus Fieb.
Idiocerus confusus Flor.
Athysanus obsoletus Kbm.
A. obsoletus Kbm. var. *piceus*.
Thamnotettix prasinus Fall.
Empoasca smaragdula Fall.
Typhlocyba quercus Fab.
T. ulmi L.
Psylla alni L.

ORTHOPTERA.

Labia minor Leach, taken in Aske Park.

An afternoon spent in the Park at Darlington enabled an examination of the tree trunks to be made, when the following were noted : *Phytocoris* *tiliæ* F., *Blepharidopterus angulatus* Fall. among the Heteroptera, *Amphigerontia bifasciata* Latr., *Reuterella helvimacula* End. (very plentiful on various trees, both males and females), *Mesopsocus unipunctatus* Mull., *Elipsocus hyalinus* Steph. among the Psocoptera, with *Dicyphus epilobii* Reut. on *Epilobium hirsutum*, and the lesser earwig, *Labia minor* Leach, resting on vegetation by the river.

PLANT GALLS (J. M. Brown).—The varied country traversed during the excursion and the season of the year were favourable to those members interested in plant-galls, and as the usual gall-seekers were aided on this occasion by several recruits, the number obtained was fairly good. The following list of those collected has been drawn up in conjunction with Miss E. M. Pilkington :

PLANT GALLED.	GALL PRODUCER.	LOCALITY.
Lastrea filix-mas	*Anthomyia signata* Br.	Aske & Greta Banks.
Picea sp.	*Chermes* sp.	Whitcliffe Woods and Greta.
Salix sp.	*Pontania pedunculi* Hart.	Cronkley.
S. caprea	*Oligotrophus capreæ* Win.	Whitcliffe Woods.
Betula alba	*Contarinia betulina* Kief.	Aske.
Alnus rotundifolia	*Eriophyes lævis* Nal.	Whitcliffe Woods and Greta.
,,	*E. nalepai* Foc.	Banks of Greta.
,,	*E. brevitarsus* Foc.	Banks of Greta.
Corylus avellana	*E. avellanæ* Nal.	Whitcliffe Woods.
Quercus sessiliflora	*Andricus curvator* Hart.	Whitcliffe Woods.
,,	*A. pilosa* f. *fecundator* Hart.	Whitcliffe and Greta Banks.
,,	*Biorrhiza pallida* Oliv.	Whitcliffe Woods and Greta Banks.
,,	*Neuroterus baccarum* f. *lenticularis* Oliv.	Whitcliffe Woods and Greta Banks.
,,	*N. vesicator* f. *numismatis* Oliv.	Whitcliffe Woods.
,,	*Dryophanta verrucosa* f. *divisa* Hart.	Greta and Aske.
,,	*D. similis* f. *longiventris* Hart.	Greta and Aske.
,,	*D. taschenbergi* f. *folii* L.	Whitcliffe Woods and Greta Banks.
,,	*D. disticha* Hart.	Whitcliffe Woods.
,,	*Cynips kollari* Hart.	Aske and Whitcliffe Woods.
,,	*Macrodiplosis dryobia* Low.	Whitcliffe Woods.
Ulmus campestris	*Schizoneura ulmi* L.	Whitcliffe Woods and Greta Banks.
Urtica dioica	*Perrisia urticæ* Per.	Greta Banks, and a particularly fine specimen at Aske.
,,	*Trioza urticæ* L.	Aske.
,,	*Aphis urticæ* Fab.	Aske.
Prunus spinosa	*Aphis padi* L.	Aske.
Pyrus aucuparia	*Eriophyes pyri* Pag.	Whitcliffe Woods.
P. mali	*Aphis pyri* Fon.	Whitcliffe Woods.
Prunus padus	*Aphis padi* L.	Aske.
,,	*Eriophyes padi* Nal.	Banks of Greta.
Rosa canina	*Rhodites eglanteriæ* Hart.	Whitcliffe Woods.
Spiræa ulmaria	*Perrisia ulmariæ* Br.	Greta Banks and Whitcliffe Woods.
Cratægus monogya	*Aphis cratægi* Buck.	Banks of Greta.
,,	*Perrisia cratægi* Winn.	Jockey Cap Hill.

PLANT GALLED.	GALL PRODUCER.	LOCALITY.
Acer pseudoplatanus	*Eriophyes macrorrhynchus* Nal.	Aske & Whitcliffe W.
,,	*Phyllocoptes acericola* Nal.	Common.
,,	*Eriophyes macrochelus* Nal.	Aske.
Tilia europæa	*Contarinia tiliarum* Kief.	Aske.
Epilobium angustifolium	*Aphalara nebulosa* Zett.	Banks of Greta.
Fraxinus elatior	*Psyllopsis fraxini* L.	Common.
,,	*Perrisia fraxini* Kief.	Aske & Greta Banks.
Nepeta hederacea	*Oligotrophus bursarius* Br.	Aske.
Veronica chamædrys	*Perrisia veronicæ* Val.	Whitcliffe Woods.
Heracleum sphondylium	*Macrolabis corrugans* L.	Aske.
Senecio jacobæa	*Stictodiplosis jacobæa* Löw.	Aske & Greta Banks.
Plantago lanceolatus	*Tylenchus* sp.	Greta Banks.
Circæa lutetiana	Apparently galled by an aphis.	Aske.

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As **Fishery Investigations, Series II., Vol. XI., No. 1** has been issued **The Flow of Water through the Straits of Dover as gauged by continuous current meter observations at the Varne Light-vessel. Part I.—Methods employed, with a Preliminary Survey of the Results,** by **J. N. Carruthers** (109 pp., 10/- net). Naturally the report is somewhat complicated, but unquestionably the importance of the material printed and the wealth of diagrams and maps will be of exceptional value to future investigators.

The Social Insects : Their Origin and Evolution, by **William Mortimer Wheeler.** London : Kegan Paul, Trench, Trübner & Co., xviii.+378 pp., 21/- net. In 1925, twelve lectures were delivered at the University of Paris, and were subsequently published under the title 'Les Sociétés d'Insectes, leur Origine, leur Evolution,' in the *Encyclopédie Scientifique*, edited by Professor M. Caullery. These essays have now appeared in English, and can well be recommended to those interested in the wasps, bees, ants, termites and similar species. There are also chapters on The Origin of the Terebrantia and Aculeata ; Polymorphism ; The Social Medium and Trophallaxis ; The Evolution of the Guests and Parasites of the Social Insects ; and The Evolution of the Social Parasites. There are 79 excellent illustrations, and a bibliography which is remarkable for its completeness.

Die Lebewelt unserer Trias, by **Martin Schmidt.** Ohringen, 1928. The object of this book is said to be to give an exhaustive survey of the fauna and flora of the German Triassic rocks. It is intended not only for teachers and students, but for fossil collectors, and to be a popular work rather than an elaborate monograph. Almost every species is figured, and the source of each figure is given. The figures are rather sketchy, and apology is made for this, but they seem in most cases to be adequate, and they are no fewer than 1,220 in number. The references are said to number more than 2,300. A Bibliography of over 300 works is given, and it is perhaps natural that almost all are German ; the English, *e.g.*, being only three in number. There is also a Glossary of anatomical terms, and a list of families, genera and species in alphabetical order. The author anticipates that there are omissions and errors, and welcomes criticism in case of a second edition. A general account of the development of the German Trias is given, amounting to 38 pages, while three folding tables give the local characters and thicknesses of the Bunter, Muschelkalk, and Keuper, respectively, throughout Germany. The idea of the book is excellent. Supposing that the data are correct, such a cyclopœdia of the German Triassic palæontology should prove very useful, especially as Germany was the original type area for the system, and is still the type locality for the continental Trias.—R.L.S.

YORKSHIRE NATURALISTS AT AUSTWICK.

F. A. MASON, F.R.M.S., AND W. H. PEARSALL, D.Sc., F.L.S.

THE three hundred and forty-first meeting of the Yorkshire Naturalists' Union was held at Austwick on June 14th in glorious weather, when a large attendance of members visited Oxenber.

Starting from the western end and working along the base of the rocky hillside, the party crossed the limestone pavement into Wharfe Gill and finished the morning by lunching (with tea) in a farm. In the afternoon, Wharfe Wood and the Feizor caves and woods were visited, the return being made along the southern edge of the hill.

The meeting was held in the meeting room of the Austwick Field Club, Mr. W. P. Winter being in the chair. After the customary reports had been rendered, hearty votes of thanks were accorded to Messrs. W. K. Mattinson and C. A. Cheetham, who had acted as leaders, and to Mrs. Clapham, who had given permission to the Union to visit her property. One new member was elected.

GEOLOGY (W. P. Winter) :—The broad structure of the immediate district consists of Pre-Carboniferous beds forming the floors of the valleys, with their strata crumpled and much eroded. Where suitable exposures occur in the hill-slopes the conglomerate of pebbles of the older formations occurs just above the eroded edges, and represents a consolidated sea-beach upon which the limestone was subsequently laid down.

On the lee side of every projecting mass of rock there is a greater or less accumulation of glacial material. This itself is usually more calcareous than the normal soil from the older rocks and less calcareous than that formed from the limestone. Hence as we pass on to it from either of the ' solid ' rocks we recognise a well defined change of flora. The top of Oxenber itself is largely free from drift, but here and there are tell-tale boulders, dark coloured, with their characteristic mosses and lichens ; obviously strangers. These are erratics moved by the ice to their present position in much the same way as the well-known ones upon Norber just across the valley. The white limestone itself shows the usual great joints with their enlargement by weathering and rounding of the edges. Mr. Cheetham called attention to some rather unusual weathering and this is being investigated.

VERTEBRATE ZOOLOGY (W. K. Mattinson) :—No exceptionally rare birds or other animals were seen. A pair or two of Stock Doves were nesting on Oxenber with the colony of Jackdaws there. A Nightjar was flushed on the top of the hill, and no doubt a pair bred there, as I heard them later in the summer. A Redstart was seen ; these birds used to be common summer visitors, but are now very scarce. Wheatears were in abundance, and although they are reported to be less plentiful than usual in some districts, here they are as numerous as ever. Curlews were seen on Wharfe Moss where they nest, and Redshanks and Sandpipers on the beck side. Redshanks were unknown here 40 years ago, but are now among the commonest of our waders, whereas Sandpipers are decreasing in numbers. One or two pairs of Woodcock bred in Feizor Wood. The Garden Warbler, which is not a common bird here, was heard and seen in Wharfe Wood. The Corncrake, which years ago could always be heard in the meadows between Austwick and Oxenber, was conspicuous by its absence, though a pair has returned to the meadows near Harden Bridge this summer.

DIPTERA (C. A. Cheetham) :—The weather was not favourable to entomologists, and diptera were scarce. On the limestone pavement the two species which have been noticed previously, *Tipula variicornis* Schum. and *Dactylolabis sexmaculata* Mcq., were seen, and *Molophilus* *murinus* Mg. was flying in small swarms in and out of some of the deep crevices. The few species collected on the excursion were :—

Tipula maxima Poda.
T. scripta Mg.
T. flavolineata Mg.
T. pruinosa Wied.
T. variicornis Schum.
T. lunata L.
Limnophila fulvonervosa Schum.
Ormosia nodulosa Mg.
Molophilus murinus Mg.
Dactylolabis sexmaculata Mcq.
Dolichopus ungulatus L.
Microchrysa polita L.
Eristalis horticola Deg.
Macrorchis meditata Fal.
Azelia macquarti Staeg.
A. cilipes Hal.
Hylemyia nigrimana Mq.
H. variata Fal.
Hebecnema nigricolor Fal.
Mydæa wibana Mg.
Fannia serena Fal.
Limnophora exsurda Pnd.
Sapromyza rorica Fal.

FRESHWATER BIOLOGY (H. Whitehead) :—The stream in Wharfe Gill below the waterfall is shallow, and the bed contains moss-covered stones. The fauna is very similar to that of Austwick Beck, and contains the Mayflies, *Bœtis* sp., *Ephemerella ignita* and *Ecdyurus venosus*. The large stonefly, *Perla cephalotes*, is common under stones. The Caddis, *Hydropsyche angustipennis*, is very common. This larva does not build a case, but spins a net under stones which acts as a sieve and retains plankton, detritus and small animals upon which Hydropsyche feeds. Pupæ of *Rhyacophila dorsalis* and larvæ of *Silo pallipes* were also found. Larvæ of *Simulium* occur.

The moss at the base of the waterfall has numerous nymphs of *Protouemura meyeri*, with larvæ of Diptera.

BOTANY (W. H. Pearsall) :—The chief interest of the Oxenber area lies in the transition it shows from a limestone vegetation to one characteristic of acid soils as one passes from the western face towards Wharfe Wood. This is due chiefly to the varying depth of glacial drift, which is thinnest at the west—but the most acid soils occur only on the boggy patches off the limestone in Wharfe Wood—where the underlying rock is slate. The woodlands are mostly rather irregularly cut and grazed, and hazel is consequently very abundant. In general, however, the transition is from woods of the ash type—with sycamore abundant on the scree slopes—to woods with *Betula pubescens* and oak on the more acid soils. The ground flora types are equally varied. The weather having been dry on the occasion of this meeting—conditions were not very suitable for work on mosses and hepatics, and most time was spent on the flowering plants, which were in very good condition. Some of the more notable of these included *Botrychium lunaria*, *Habenaria albida*, *Helleborine atropurpurea*, *Orchis fuchsii*, *Polygonum viviparum*, *Potentilla verna*, *Geranium sanguineum*, *Pyrola minor*, *Hippocrepis comosa*, *Polygonatum multiflorum* and *Daphne laureola*.

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H. H. Gregory writes on ‘ Swanimote Rock,’ with illustrations of rock sections, and G. J. V. Bemrose on ‘ The Flora of Rutland,’ in the *Transactions of the Leicester Literary & Philosophical Society*, Vol. XXIX.

The Report of the Natural History Society of Northumberland, Durham and Newcastle-upon-Tyne is a little more encouraging than has been the case for some years. Over £1000 has been received or promised towards the cost of urgent repairs and assistance.

The Fifty-second Report of the Chester Society of Natural Science is to hand and contains a record of the Society's various proceedings. A George Peddie Miln Memorial has been established in recognition of the valuable services Mr. Miln rendered to the Society as Honorary Secretary. Over £300 was subscribed and will be invested to endow a annual ‘ Miln Memorial Lecture.’

CORRESPONDENCE.

BRITISH ASSOCIATION MEETINGS.

Hundreds of members are annoyed because lecturers will not 'speak up.' You know this, of course. I wish you had to give all lecturers a drilling. Perhaps you can do something with your pen.

I would like to see a notice like the following placed before each speaker before he begins :—

> 'Speak up, and speak clearly. Do not drop your voice at the 'end of a sentence. Remember that your voice must reach the 'person in the audience farthest from you. If every word you utter 'is not heard without strain your audience will become irritable, 'and make statements which reflect upon your intelligence, however 'great may be your knowledge of the subject.'

Chairmen of Sections should also be on the alert. They should, I think, advise obviously young and inexperienced speakers before they begin, and also whenever they note the tendency to drop the voice, to speak as if only to the reading desk, the front row of the audience, or the screen, with their back to the audience.

The Chairman of one Section at Glasgow was himself a whisperer.—Yours faithfully, A. E. PECK.

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Mollusca at Sledmere, 1928.—The occasion of the Fungus Foray at Sledmere, August 24th to 29th, allowed of some examination of the district mollusca. With the assistance of Mrs. Morehouse and her daughter, the following species and varieties were observed, as certified by Mr. Sowden, of York :—

1. *H. nemoralis* v. *libellula* s.v. *flava*.
2. ,, v. ,, s.v. *quinquefasciata*, 12345.
3. ,, v. ,, s.v. *nilssonia* (123)45.
4. ,, v. ,, s.v. *kleinia* (12345).
5. ,, v. ,, 02345.
6. ,, v. ,, s.v. *roseolabiata*.
7. ,, v. *rubella* s.v. *rosea quinquefasciata* 12345.
8. ,, v. ,, s.v. *bonnania* 10345.
9. ,, v. ,, s.v. *rosea bifasciata* (123) (45)
10. ,, v. *rubra*.
11. *H. hortensis*. v. *lutea* s.v. *lafondia* 12345.

Arianta arbustorum.
,, ,, v. *flavescens*.
Hellicella itala.
,, *virgata*.
,, ,, v. *subdeleta*.
,, ,, v. *allucans*.

Theba cantiana, *Clausilia laminata*, *Vitrea cellaria*, .*V. alliaria*, *V. rogersi*, *V. nitidula*, *Vitrina pellucida*, *Euconulus fulvus*, *Hygromia hispida*, *H. rotundata*, *H. rufescens*, *Helix caperata*, *Ena obscura*, *Cochlicopa lubrica*, *Carychium minimum*, *Acanthinula aculeata*, *Jaminia muscorum*.

Limnea truncatula, *Sphærium lacustre*, *Planorbis spirorbis*.

Arion ater, *Limax maximus*, *Arion ater* v. *brunnea*, *Agriolimax agrestis*, *A. lævis*.—GREEVZ FYSHER.

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According to Sir Flinders Petrie's *Ancient Egypt*, the Glozel tablets show the mis-spent ingenuity of an uneducated mind.'

NORTHERN NEWS.

A publication from Shanghai addressed to us at 'The Museum, England, *via* Serbia,' has safely reached us. The word 'The' was not in italics.

Mr. Parker Brewis figures and describes a Whitby jet necklace found with a Bronze-Age burial at Kyloe Northumberland, in *Archæologia Æliana* for 1928.

We have received interesting syllabuses from the Leeds Naturalists' Club, the Leeds Co-operative Naturalists' Society, and the Darlington and Teesdale Naturalists' Field Club.

Little Jones (who has just finished a book about the wonders of nature): 'Nature is marvellous! When I read a book like this, it makes me realise how puerile, how insignificant is man!' His Better Half: 'Huh! A woman doesn't have to wade through 400 pages to discover that!'—*Passing Show.*

An anonymous writer, in a contemporary, has made a discovery. He has found that limpets actually burrow in the rock, and he reproduces a photograph to prove it. He also tells us that limpets 'are by no means an uncommon sight on the sea shore.' Possibly this writer would have 'wept like anything to see such wondrous heaps of sand.'

Sir Arthur Evans has presented to the Ashmolean Museum, Oxford, the magnificent collections of Stone Age and Bronze Age implements formed by his father, the late Sir John Evans. These collections contain the greater portion of the specimens figured in Sir John Evans' well-known works dealing with 'Ancient Stone Implements of Great Britain' and the 'Ancient Bronze Implements of Great Britain.'

The following complaint is made by an editor of a contemporary:—'A large proportion of letters is addressed to the last editor but one at his last residence but two. A smaller proportion is addressed to his successor, who retired fifteen months since, while a considerable number of communications for the editor go to the publishers at an address which they left more than a year ago. To say nothing of the needless labour involved, it may well be that some communications never reach their goal; and certainly some that would otherwise have been welcome arrive too late.'

——:o:——

The case for the protection of the Kestrel is stated in the autumn number of *Bird Notes and News.*

'The Economic Status of British Finches' is the subject of a memoir by F. C. R. Jourdain in *The Journal of the Ministry of Agriculture* for October.

'The Brown Rat,' by C. B. Moffat; 'A Flight of Ants,' by R. J. Welch; 'Dragonflies,' 'Diatoms,' 'A Prehistoric Heath (? Hearth),' and 'Bone Caves,' are among the contents of *The Irish Naturalists' Journal* for September.

In *British Birds* for October, Mr. E. Chance writes on 'Cuckoos' Eggs,' and records that two, and sometimes three eggs occur in one nest. He states that his collection consists of about thirty examples found during the last 12 years, either by himself or his friends, which suggests that the cuckoo has to take his chance as Chance seems to have taken the eggs of the cuckoo!

We take the following from *The Museums Journal*:—'Harrogate Museum: This is not one of those museums that sets its own locality before the rest of the world. "The list of goods" (to quote the *Harrogate Herald*) recently obtained comprises such objects as a gourd from Corsica, a fly whisk from Delhi, a parchment note-case from Florence, part of a walrus tusk, a Turkish horse-shoe, and a Norwegian cow-bell. Why travel abroad, when healthy Harrogate can provide you with a souvenir from every country under Heaven?"

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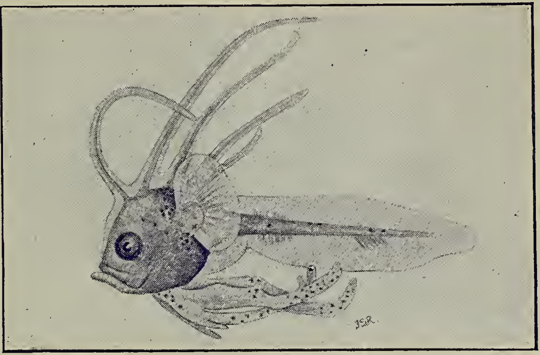

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The Museums, Hull;
and T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Tolson Memorial Museum, Huddersfield,
WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF
JOHN W. TAYLOR, M.Sc. RILEY FORTUNE, F.Z.S.

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YORKSHIRE NATURALISTS' UNION.

COMMITTEE OF SUGGESTIONS FOR RESEARCH.

A Meeting will be held at the Leeds University on December 3rd, at 5-30 p.m., to receive the report of the Sub-Committee dealing with the Rivers Investigation.

Chris. A. Cheetham.

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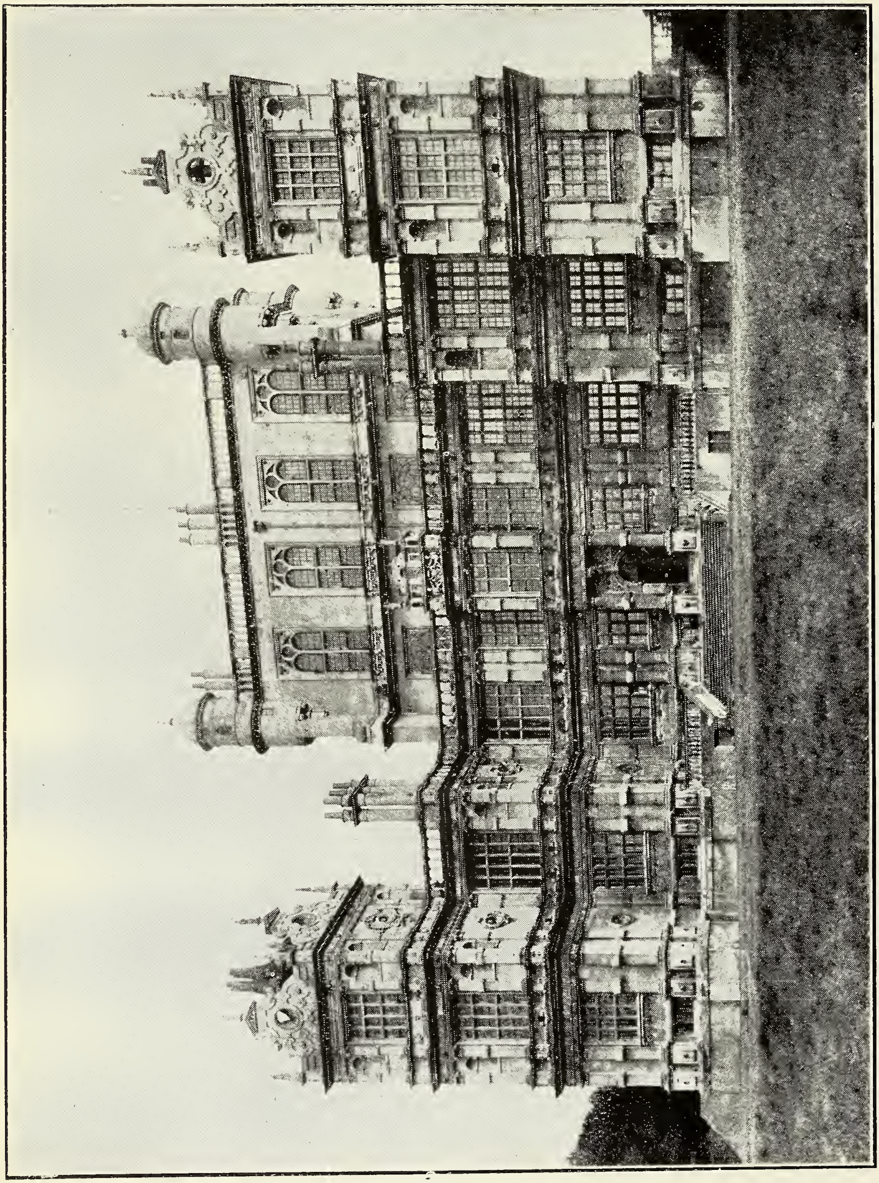


Wollaton Hall.

Photo F. A. Smith

NOTES AND COMMENTS.

NOTTINGHAM NATURAL HISTORY MUSEUM.

Professor J. W. Carr, the Director, has issued an admirable account of the Nottingham Natural History Museum, 1872-1928 (12 pp.). The collection is now housed in Wollaton Hall, which has been purchased by the Nottingham Corporation for the purpose. 'Wollaton Hall is a magnificent Elizabethan building standing in a noble Park of 744 acres. It was built for Sir Francis Willoughby, probably by Robert Smithson, from the designs of John Thorpe. It took eight years to build, *i.e.*, from 1580 to 1588, and it is recorded that the stone was brought from Ancaster on the backs of pack-horses in exchange for coal from Wollaton Pits. Nevertheless, the cost is said to have been £80,000, an immense sum for that period. On the death of Sir Francis, the estate passed through his eldest daughter to her husband and cousin, Sir Percival Willoughby. The grandson of Sir Percival was the celebrated naturalist and traveller, Francis Willoughby, who was the friend and patron of the still more eminent naturalist, John Ray, who seems to have spent much time at Wollaton Hall. It is therefore peculiarly appropriate that the building from which emanated some of the best scientific work of the seventeenth century should now be devoted to the pursuit of Natural History.' By kind permission we herewith reproduce one of the illustrations, as Plate X.

BRITISH SPELÆOLOGISTS.

The Spelæological Society of the University of Bristol is to be congratulated on the continuance of its excellent work, scientifically carried out. It is fortunate also in obtaining substantial financial assistance from different sources. *The Proceedings* for 1927 (3/-), recently published, besides a general survey of the Society's activities, has three well-illustrated monographs, viz., ' Excavations at King Arthur's Cave,' by H. Taylor ; ' Excavations at Sun Hole,' by E. K. Tratman and G. T. D. Henderson ; and ' Excavations at Gough's Cave, Cheddar,' by J. A. Davies. The ' finds ' recorded are particularly valuable.

MANCHESTER MICROSCOPISTS.

The Annual Report and Transactions of the Manchester Microscopical Society for 1926 have just been received and give evidence of the continued vigour of this old-established Society. In addition to the usual reports, lists of members, etc., there are the following valuable contributions by members : ' The Organ of Taste and Smell,' by J. Stuart Thomson ; ' Some Recent Investigations on *Lathræa squamaria*,' by Isaac Hartley and Holmes Ellis ; ' John Benjamin Dancer,' by Henry Garnett ; and ' Note on the Technique of Investigating

Coal-Measure Plants,' by John Walton. The last paper is of especial interest to those investigating coal-measure plants, and from the illustration accompanying his paper it would appear that these can now be prepared for examination almost as readily as if they were fresh plants.

PREPARATION OF COAL PLANTS.

Mr. Walton states : ' If we split open a rock and expose a fossil plant the latter is then left supported only on one side, that next the rock. If we then paint the surface of the fossil and the surrounding rock surface with a layer of a solution of cellulose acetate or white of egg we replace the support taken away from the fossil when the rock was split open for the solution dries and forms a tough skin over the fossil. We can now remove the rock from the other side of the fossil by dissolving it away in acid which virtually removes it particle by particle and exposes finally the other surface of the fossil in an undamaged state. We now have the fossil completely free from the rock mounted on a transparent film and are able to examine both surfaces by reflected light and if the fossil is at all translucent, examine it by transmitted light as well. It can also be examined with ease under a microscope.'

THE UNIVERSITY OF LEEDS.

Her Grace the Duchess of Devonshire recently laid the foundation stone of the first new buildings in connection with the proposed scheme for the enlargement of the University of Leeds. 'The Mining Block is the first of the new buildings to be erected under the scheme for the enlargement of the University, which was designed by Messrs. Lanchester, Lucas, and Lodge, the winners of the architectural competition. The Department stands at the extreme north of the University's site and forms the right wing of the new University front as seen from Woodhouse Lane. Towards the cost of this buildng the Yorkshire Coal Owners' Association has contributed £25,000, and the Miners' Welfare Committee, £10,000. In accordance with a decision reached by the University authorities after very careful consideration, the front of this building, as well as the other buildings, will be of Portland stone. The back elevation will be of a good local brick with stone dressings. The building is 158 feet long. The general width of the building is 44 feet, but the central portion stands farther back in the form of a single storey glass-roofed shed which is capable of easy modification should the necessity arise owing to the development of the work of the Department. In common with the other buildings in the scheme, the block will have a flat roof, and the height of the parapet above ground level is 46 feet. The work of construction is in the hands of Messrs. William Airey and Son (Leeds), Ltd.'

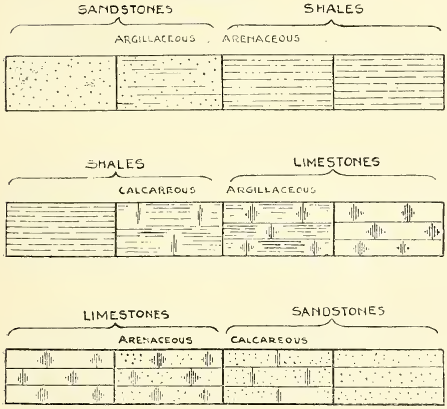
STANDARD NOTATION FOR GEOLOGICAL SECTIONS.

At a recent meeting of the South Wales Institute of Engineers, Professor G. Knox referred to the above subject, and submitted a scheme which had been adopted by a special Committee appointed by the Institute. This is given in *The Colliery Guardian* for October 5th, to the Editor of which we are indebted for the loan of the accompanying blocks. The author stated that the first object the Committee had in view was to make the geological information supplied to the Institute of more value to its members. The second object was to invite the other mining institutes to join with them in an attempt to standardise the symbols and nomenclature so that the information supplied to the various mining institutes would, for comparative purposes, be more readily understood by those engaged in other coal fields. It was hoped that, as a result of these negotiations, some system capable of general application would be evolved and, if so, that the co-operation of the Geological Survey might be obtained in getting it stabilised in the various coal fields.

SANDSTONES AND SHALES.

The basis of the committee's suggested notation is the three chief groups of clastic rocks and their chief intermediates (fig. 9). This shows the gradual change from sandstone through shale to limestone and back to sandstone. The symbols are simple and distinct enough to be easily distinguishable, and are based on those generally used in this and other countries. The sandstones are divided into four groups (fig. 1)—namely, massive, bedded flagstones, and current bedded sandstones, with two intermediates containing shale and lime. It was suggested that some symbol should be devised for different coloured sandstones which sometimes, as in the case of yellow Wentarw sandstone in the South Wales coalfield, forms a conspicuous horizon over a long part of the field, but it was decided not to make the scheme too complex. The three chief types of shale are the argillaceous, mudstones

FIG. 9.



and carbonaceous, or bituminous so-called (fig. 2). The symbols suggested are quite distinctive, and, in the case of the former and the latter, have long been in use to denote these types of rock. The two intermediate shales have already been referred to ; likewise, the limestone group. In the case of fireclay, the committee decided to retain the vertical shading symbol, as this has been in use on the Geological Survey sections for many years, although, speaking generally, they preferred the rootlet symbol, with the addition of dots to represent ganister.

FIG. 1

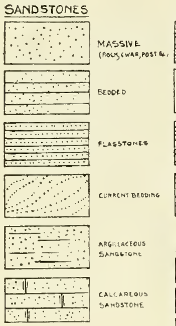


FIG. 2

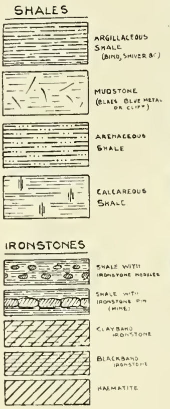

SHALES
ARGILLACEOUS SHALE (BIND, SHIVER &C)
MUDSTONE (BLAES BLUE METAL OR CLIFT)
ARENACEOUS SHALE
CALCAREOUS SHALE
IRONSTONES
SHALE WITH IRONSTONE NODULES
SHALE WITH IRONSTONE PIN (MINE)
CLAYBAND IRONSTONE
BLACKBAND IRONSTONE
HAEMATITE

FIG. 3

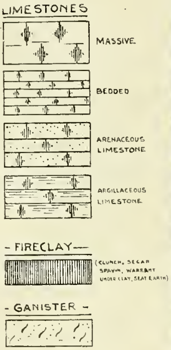
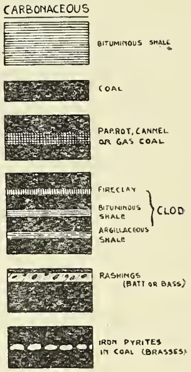


FIG. 4



IRONSTONES, COAL, ETC.

As the ironstones frequently form well-known horizons, whether, as nodular bands, pins or definite seams, they have been included (fig. 2). Hæmatite is represented by heavy lines sloping to the left, and this superimposed on a shale would denote clayband, and on a carbonaceous (bituminous) shale blackband ironstone. Nodules or pins in shalebands are indicated merely by left-hand shading. There is no difficulty regarding the symbol for coal (fig. 4), but it was thought advisable to use symbols to distinguish cannel (parrot or gas) coal from ordinary coal and to include some distinctive marking for ' clod,' according to its composition. This applies equally to ' rashings ' and ' brasses.' No symbol is suggested for oil shale, as it was thought that the Scottish patterns might be adopted in later discussions with the other institutes. The question of introducing symbols to represent various kinds of coal was considered, but it was decided that these could be best included in descriptive terms alongside the section. The committee also considered the advisability of introducing symbols to represent shelly or other fossiliferous bands which form well-defined horizons, but concluded that this also could be accomplished by descriptive terms printed on the section. Symbols are suggested for the coarser rocks, breccia, conglomerates and grits, together with marl (fig. 5). The alluvium and other superficial deposits are shown in fig. 6, in which the 'bird' is taken as the chief symbol, with the ordinary shale, sand and grit markings to indicate the nature of the deposit. The peat symbol is a combination of the alluvium and coal notation. The question of a symbol for boulder clay was discussed, but it was decided to defer this for the present. The chief metamorphic (fig. 7) and igneous rocks (fig. 8) were introduced as an afterthought. The former are rarely associated with coal mining in this country, but the latter are met with in the North of England and very frequently in Scotland, although absent in the South Wales and other British coalfields.

FIG. 5

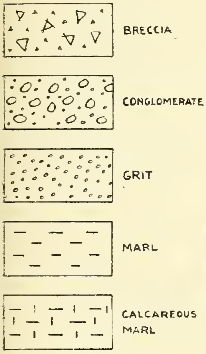


FIG. 6

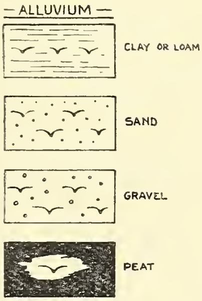


FIG. 7

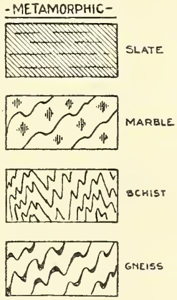
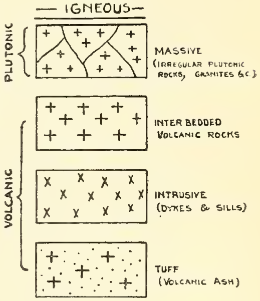


FIG. 8


— IGNEOUS —
PLUTONIC
MASSIVE (IRREGULAR PLUTONIC ROCKS, GRANITES &C.)
VOLCANIC
INTER BEDDED VOLCANIC ROCKS
INTRUSIVE (DYKES & SILLS)
TUFF (VOLCANIC ASH)

TREE INJECTION.

The Dutch Elm Disease, due to the fungus *Graphium ulmi* Schwarz., continues to give cause for anxiety to our continental friends, and we have been favoured by a pamphlet emanating from Walter Ilisch, of Quakenbrueck, Hannover, in which claims are made for combating the disease by methods of injection. The arguments are printed in very curious English as the result of translation by one inexperienced in the art, and a too literal rendering of the German idiom in our language makes it rather difficult to read with the seriousness with which it has been composed. So far there is no official recognition of the value of Herr Ilisch's methods, and we have to take his own version of the results he has obtained.

1928 Dec. 1

HISTORY OF DEVELOPMENT.

'In 1920 already, I occupied myself theoretically with the possibility of injecting trees, starting from the relations of parasites to mankind, animal, and plant. May I explain it by the fowolling (sic.) examples: Especially the combatants of the world-war will have been astonished at the fact that under the same circumstances one person had by far more to suffer by parasites than another. To farmers and breeders of animals it is known that, for instance, a pig with lice is regarded to be one of the healthiest, and that a sick pig is exempted from lice. Something similar to that, we have in the vegetable kingdom. For example the wooly-louse or wooly aphis of apple (*schizoneura canigera*) does not go upon all kinds of apple trees, but only upon certain sorts; other kidneys, at their side, remain spared by them. The reason, to be sure, is the circumstance that certain stuffs in the sap of the plant or the bad blood of man or animal—the food of the lice—do not agree with the parasites. Knowing this, I said to myself, change the sap of plants invaded by parasites, and the food will no longer be liked by the lice that will avoid those plants, leave them or die.'

'AGARIC-DISEASES.'*

'Having been proved in 1921 that a repression of tree parasites is possible by injection, I continued intensively my experiments during the following years. Besides the combat against animal parasites, I occupied myself with the repression of agaric-diseases as, for instance, *Monilia fructigena* and *Taphrina* (curly disease) on stone fruits, illness of plane-trees' loosing their leaves (*Gloeosporium nervisequum of Platanus*) and others. By means of special preparations, I had also good results in this endeavour, and hereby encouraged, I resolved to extend my experiments even into the sphere of the still increasing dying of elm-trees (*ulmus*). Already in 1919 a dying of elm-trees has been observed in Holland. From here the disease advanced from district to district to such en extent that it will be found nowadays all over Holland, in the whole Belgium, in the north-east of France, and almost everywhere in Germany. The characteristic marks of illness are extremely different, and there is nothing to be astonished at that as well science as professionals stood before a riddle. The gap among the number of elm-trees became larger and larger. Rotterdam, for example, lost more than 7000, Nurnberg more than 2000 elm-trees. And even now, the end of this ravaging epedemic is not yet to be expected. Some scientific men believed that the malady of elms (*ulmus*) was not caused but by the influence of weather, *i.e.*, by too great a dryness or by too severe a frost. However, I could not believe in it as the epedemic, if it were true, would have been limited to a certain space of time. The dying of these trees would have happened—if weather had been the cause—at all places or regions where it was very dry, but that is not the real fact. On the contrary, the fact of the epedemic's advance by zones made me think that it must be a contagious illness. Already in 1924 I began my essays of injection against elm-dying. Although I have been laughed at, my opinion remained the same, and that I have been right has been proved later-on.'

---

* The use of the word 'agaric' throughout the pamphlet is due to incorrect translation of the German 'pilz.'

A TESTIMONIAL.

Directions for injecting trees are given. The nature of the ' injecting stuff ' is not disclosed, but it may be obtained from the author. The quantity used varies from 50 cc. to two and a half litres, according to the size of the tree. It will be interesting to see how far this method of treatment helps towards the very desirable repression of plant pests. An unsolicited testimonial as to its efficacy in other hands is printed as follows : ' Your system of treating trees is as well in application as in effect second to none. No smearing or painting, no squirting ! What a loss of time with remedies which, up to now, one has been obliged to put upon each attacked spot, on every little twig, even in dizzy highness, on the root which must be laid open for that purpose ; what a trouble, if they were to be applied in a warm state, and with those which were to be squirted ! How, then, did your suit look, your face, your hands ! The injection, on the other hand, is a very easy, comfortable, quickly finished, and clean work. One dare not fear to overlook one settlement ! A tree will be treated within five minutes ! And the effect? Unsurpassable ! '

——: o :——

Coleoptera near Wigton.—*Pyrochroa serraticornis* is local and uncommon in Cumberland. I took a specimen on the wing at Kelsick, and another at rest on a Pyrethrum plant in my garden. *Rhinosimus planirostris* is not uncommon. *Anaspis ruficollis* and *A. frontalis* common on Hawthorn flowers. *Niptus hololeucus* and *Anobium paniceum* occasionally in old houses at Kelsick and in Wigton. *Aphodius rufescens*, *A. fimitarius*, *A. depressus* and *A. rufipes* formed part of the crowd of insects about farm yard manure heaps on sunny days. Sweeping about Kelsick produced *Corymbites quercus*, *C. cupreus*, *Agriotes obscurus*, *A. pallidulus*, and *Cryptohypnus riparius* quite commonly. *Limonius minutus* and *Adrastus nitidulus* were much more rare. *Microcara livida*, *Malthodes dispar, Cyphon nitidulus* and *Rhagonycha limbata* were beaten from hedges about Dundraw, the last named quite commonly. *Telephorus bicolor* and *T. hæmorrhoidalis* generally common, while *T. flavilabris* occurred at Aikton.—JAS. MURRAY, Gretna.

Crepis nicæensis Balb. (Eur.) at Burton Agnes.—On the 17th June, 1923, Mr. Major Lawson, of Bridlington, discovered a plant belonging to the genus *Crepis*, growing on waste grass-land at Burton Agnes. The land is not cultivated, but the grass is mown every season. Since this date, he has noted the plant each year, and although distinguished botanists have been consulted relative to its identity, there has been in this regard much confusion. However, this year, the question has been decided by Dr. G. Claridge Druce, F.R.S., who names it *Crepis nicæensis* Balb. Dr. Druce writes : ' I am very pleased to see your plant. It is *Crepis nicæensis*, in which I am quite interested. Is it still to be seen *in situ?* It differs from *C. capillaris* and *C. brennis* in its being a rougher plant, with often many setæ on the peduncles. The receptacle is quite different, being fovillate—each hole where the achene springs from has a winged border.' Mr. Lawson informs me that the place where this *Crepis* grows is a large grassy space, which is fenced. At the end of June, the plant is three feet high, a sturdy and handsome growth in full flower. Then the mower comes, and cuts it with the grass for hay. In September, secondary growths have developed. These flower and fruit, but the flowers are not so fine as the June blooms. In J. Fraser Robinson's ' Flora of the East Riding of Yorkshire ' there is no mention of *Crepis nicæensis*, and so far as I can ascertain there is no record of this plant for the East Riding, and the same remark applies to the North Riding. But F. Arnold Lees, in his ' Flora of West Yorkshire,' gives one record only, in a field at Harlow Hill, Harrogate, the plant having been found by T. J. Foggitt in 1876. Lees points out that he himself saw it *in situ.* It seems likely, therefore, that Mr. Lawson's discovery is a second record for the county, and, perhaps, the only one at the present time. I would like to suggest that *Crepis nicæensis* may be confused sometimes with *Crepis brennis* Linn. and *Crepis taraxacifolia* Thuill. Both of these plants are rare in Yorkshire.

[Since correcting the proof of the above, I have received a letter from my friend, Mr. Thomas J. Foggitt, of Thirsk, in which he states : ' It was my grandfather, T. J. Foggitt, who found it (*Crepus nicæensis*) at Harlow Hill, Harrogate, in 1876. I don't believe it has been seen there since. My father (W. Foggitt) saw it near Thirsk on the 19th June, 1899 ; 4th June, 1901 ; 16th June, 1901. I have not noticed it in recent years.']—R. J. FLINTOFF, Recorder, East Riding.

THE GENUS *FAYOLIA*.

R. CROOKALL, Ph.D., F.L.S.

(*Continued from page 332*).

FAYOLIA STERZELIANA Weiss.

Plate VIII., fig. 5.

F. sterzeliana was founded in 1887 by Weiss[1] on an uncompressed specimen discovered by Sterzel [illegible] Borna, near Chemnitz, in Saxony, which came from the Hainichen-Ebersdorfer Beds (*i.e.*, the Culm, Lower Carboniferous or Dinantian Series). The fossil is 7 cm. long, broken at both ends, and therefore appearing to be cylindrical. The segments are slightly concave and measure about 1·0 cm. across. The ribs form an angle of about 15 degrees with the margins of the organism. The spine-scars, as usual, are circular or elliptical. They are smaller than in *F. grandis*, having a diameter of 1·0 mm. as against 2-3 mm. in that species. They are also more closely placed (ten scars occurring in the space of 17·5 mm. on *F. sterzeliana*, while that number of scars occurs in about 60 mm. in *F. grandis*). The valves are ornamented by fine striæ, a feature which is absent from *F. palatina*, though present in *F. grandis*.[2] This character cannot be regarded as being of any importance. The collarette appears to have had an entire margin. Altogether, *F. sterzeliana* is smaller than *F. grandis*, and the two species could scarcely be confused.

FAYOLIA MOYSEYI Pruvost.

Plate VIII., fig. 4.

Moysey[3] described and figured a small compressed example of *Fayolia* from the Top Hard Coal (Yorkian Series) at Shipley Manor Claypit, Ilkeston, Derbyshire, as *Fayolia* cf. *dentata* Renault and Zeiller. The specimen, with its counterpart, is preserved in the Museum of Practical Geology (Nos. 24,522, 24,523), and the label bears the following note in Dr. Kidston's handwriting : ' This might be a second species, but is too much crushed and broken up to allow of the characters being clearly seen.' Moysey also regarded it as too imperfectly preserved to admit of satisfactory specific determination. In 1919, however, Pruvost[1] recorded a very similar incomplete example from the upper part of the Middle Coal Measures of Lens, France, and founded on them a new species, *F. moyseyi*.

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[1] Weiss, C. E., 1887, *op. cit.*

[2] The striæ running parallel to the ribbing in *F. grandis* are well shown by Renault and Zeiller (*op. cit.*, 1888, Pl. LXII., fig. 3).

[3] Moysey, L., *op. cit.*, Pl. XXVII., fig. 2, p. 340.

Both specimens are fusiform and incomplete, the beak and pedicle being absent. The English example is 5·0 cm. long by 1·6 cm. broad, the French one being slightly smaller (4·8 cm. by 1·2 cm.). In the former the spine-scars are 1·5 mm., or slightly more, apart, four occurring in 10 mm., while in the latter they are rather less than 1·0 mm. apart, nine being found in 10 mm. The collarette is not preserved, but its original presence is indicated by a line which is seen about midway between the sutures of the valves. Though Pruvost's specimen bears many fine striæ between the spiral ridges, these are absent from the British example. The segments are about ·5 cm. across, and there are more than six turns of the spiral, which constitutes a characteristic feature.

Pruvost pointed out that his species was distinguished from *F. dentata* Renault and Zeiller by the following features:

(1) The capsule of *F. dentata* is composed of a maximum of five turns, while *F. moyseyi* consists of more than six.
(2) In *F. moyseyi* the valves are narrower than in *F. dentata*.
(3) In *F. dentata* the spine-scars are much more closely placed.
(4) Whereas in *F. dentata* the collarette begins very near one of the lines of perforation, in *F. moyseyi* it begins about half-way between the two lines of perforations.

F. moyseyi, on the other hand, resembles *F. sterzeliana* Weiss in the comparatively large number of perforations and in their being closely placed, but differs from that species in

(1) being only about half the size;
(2) having narrower segments; and
(3) whereas in *F. sterzeliana* the collarette is generally inserted on the upper line of perforations, in *F. moyseyi* it is approximately midway between the two lines of perforations.

FAYOLIA WAREI n.sp.

Plate VIII., fig. 1.

This specimen (Museum of Practical Geology, No. R.C.253) was collected by Mr. W. D. Ware, and came from the Nine-foot Seam (Yorkian Series) at Ystradgynlais Colliery, Ystrad, near

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[1] Pruvost, P., "La faune continentale du terrain houiller du nord de la France," *Mém. carte géol. détaillée de la France*, 1919, Pl. XXVI., fig. 30, p. 450.

Swansea. It is incomplete, both pedicle and beak being absent, but 5·6 cm. are preserved. The maximum width is 1·3 cm., and the body very gradually tapers at each end. The slightly concave segments are 4 mm. in width and arise at an angle of about 15 degrees, or even less. Seven or eight turns of the spiral are shown. The specimen is compressed and the collarette not well exhibited, but it appears to lie near the line of spine-scars, had an entire margin, and was 2·5 mm. broad. The surface of the valves is marked by fine striæ which run parallel to the ribs, as in so many examples of the genus. The spine-scars, which are situated near the sutures of the valves, are very small, being about ·25 mm. in diameter and separated from each other by rather less than that distance. These are the smallest spine-scars known in the genus, nine occurring in 5 mm. This alone serves to distinguish our species. Other important distinguishing features are the breadth of the collarette and its entire margin.

In point of size it most nearly approaches *F. moyseyi*, agreeing with that species fairly well in length and breadth and in the width of the segments. It is easily separated from that species by the spine-scars, which are markedly smaller and much more closely placed.

The specimen is associated with plant remains, chiefly the root known as *Pinnularia capillacea* (L. and H.).

DESCRIPTION OF FIGURES ON PLATES.

Fayolia—Plate VIII.

Fig. 1.—*Fayolia warei* n. sp. (× $1\frac{3}{4}$).
Horizon: Nine-foot Seam (Yorkian Series).
Locality: Ystradgynlais Colliery, Ystrad, near Swansea.
Collected by W. D. Ware.
Collection: Museum of Practical Geology, No. R.C.253.
Photo: R. Crookall.

Figs. 2, 3.—*Fayolia crenulata* Moysey (× 1).
Horizon: Top Hard Coal (Yorkian Series).
Locality: Shipley Manor Claypit, Ilkeston, Derbyshire.
Collected by L. Moysey.
Collection: Museum of Practical Geology, Nos. 11,135; 11,134.
Photo: R. Kidston.

Fig. 4.—*Fayolia moyseyi* Pruvost (× $\frac{5}{7}$).
Horizon: Top Hard Coal (Yorkian Series).
Locality: Shipley Manor Claypit, Ilkeston, Derbyshire.
Collected by L. Moysey.
Collection: Museum of Practical Geology, No. 24,522.
Photo: R. Crookall.

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Fig. 5.—*Fayolia sterzeliana* Weiss ($\times \frac{5}{8}$).
Horizon: Hainichen-Ebersdorfer Beds (Lower Carboniferous).
Locality: Borna, near Chemnitz, Saxony.
Collected by J. T. Sterzel.
Photo: of Weiss's drawing.

Figs. 6, 7.—*Fayolia dentata* Seward ($\times \frac{7}{10}$).
Horizon: Lower Coal Measures sandstone.
Locality: Stainton Quarries, Barnard Castle, Darlington, Durham.
Collected by G. Best.
Drawing by Professor Seward.

Fayolia—Plate IX.

Fig. 1.—*Fayolia grandis* Renault and Zeiller ($\times \frac{11}{28}$).
Horizon: above La Grande Couche (late Stephanian).
Locality: Tranchée de Forêt, Commentry, France.
Photo: of Renault and Zeiller's drawing.

Fig. 2.—*Fayolia major* (Newberry) ($\times \frac{1}{3}$).
Horizon: Chemung Rocks (Upper Devonian).
Locality: Southern New York State, U.S.A.
Photo: of Newberry's drawing.

Fig. 3.—*Fayolia randalli* (Newberry) ($\times \frac{1}{3}$).
Horizon: Chemung Group (Upper Devonian).
Locality: Warren, Pennsylvania, U.S.A.
Photo: of Newberry's drawing.

Figs. 4, 5.—*Fayolia dentata* Renault and Zeiller ($\times \frac{5}{6}$).
Horizon: above La Grande Couche (late Stephanian).
Locality: Tranchée de Forêt, Commentry, France.
Photo: of Renault and Zeiller's drawings.

Fig. 6.—*Fayolia palatina* (Weiss) ($\times \frac{7}{18}$).
Horizon: Lebacher Beds (Lower Permian).
Locality: Alben, North of Cusel, Germany.
Photo: of Weiss's drawing.

Fig. 7.—Photo: of Renault and Zeiller's reconstruction of *Fayolia* ($\times \frac{1}{2}$).

Fig. 8.—Corrected reconstruction of *Fayolia* ($\times \frac{1}{2}$).

DISTRIBUTION OF *FAYOLIA*.

	BRITAIN AND THE CONTINENT.	NORTH AMERICA.
LOWER PERMIAN	*F. palatina* (Weiss) (Lebacher Beds, Alben, Germany)	
UPPER CARBONIFEROUS	*F. dentata* R. & Z. (late Stephanian, Commentry, France)	
	F. grandis R. & Z. (late Stephanian, Commentry, France)	
	F. crenulata Moysey (Yorkian of England)	
	F. moyseyi Pruvost (Yorkian of England, and Middle Coal Measures of Lens, France)	
	F. warei Crookall (Yorkian of South Wales)	
	F. dentata Seward (Lanarkian of England)	
LOWER CARBONIFEROUS	*F. sterzeliana* Weiss (Ebersdorfer Beds-Culm of Germany)	
UPPER DEVONIAN	*F. interstrialis* (Stainier) (Psammites du Condroz, Belgium)	*F. randalli* (Newberry) (Chemung Group, New York State)
		F. major (Newberry) (Chemung Group, Pennsylvania)

TABLE OF

(The chief diagnostic charac

SPECIES.	SHAPE OF BODY.	LENGTH OF BODY.	MAXIMUM WIDTH.	WIDTH OF SEGMENTS.
F. dentata Renault and Zeiller	fusiform	8-16 cm.*	1·5-2·5 cm.*	·5-1·0 cm.*
F. dentata Seward	broadly fusiform	8·0 cm.	2·7 cm.	·9 mm.
F. grandis Renault and Zeiller	cylindrical, narrowing at ends	more than 40·0 cm.*	3·0-4·0 cm.*	2·0-3·0 cm.
F. crenulata Moysey	cylindrical, tapering gradually	more than 11·0 cm.*	5·0 cm.*	2·1 cm.
F. moyseyi Pruvost	broadly fusiform	5·0 cm.	1·4 cm.*	·5 cm.
F. sterzeliana Weiss	cylindrical, ends not tapering	7·0 cm.	3·0 cm.*	6·0-10 cm.*
F. warei Crookall	fusiform	5·6 cm.	1·3 cm.*	·4 cm.

SPECIES.

ters are marked by an asterisk).

NO. OF TURNS.	COLLARETTE.	SPINE-SCARS.	ANGLE OF RIBS.
* 5	* NEAR ONE SUTURE, with DENTATE margin, 5-6 mm. wide	* ·75-1·5 mm. dia. 1·5-3·0 mm. apart, *i.e.*, 10 occur in 32 mm.	15-30°
11	not preserved, but indicated by narrow grooves	* 3 mm. dia. 10 occur in 10 mm.	15-30°
8-10	* margin ENTIRE, 5-8 mm. wide	2·3 mm. dia. 3·8 mm. apart, *i.e.* 10 occur in 60 mm.	45°
2½	* margin CRENULATE, 12·75-15·0 mm. wide	2·0 mm. dia. 4·6 mm. apart, *i.e.*, 10 occur in 38 mm,	15°
* more than 6	* ABOUT HALF-WAY BETWEEN SUTURES, but not clearly preserved	* 1·0 mm. or less apart, 4-9 in 10 mm.	30°
3	near one suture, margin probably entire	1·0 mm. dia. 10 occur in 17·5 mm.	15°
7 or 8	* near one suture, margin entire, 2·5 mm. wide	* ·25 mm. dia. less than ·25 mm. apart, *i.e.*, 9 occur in 5 mm.	15°

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TABLE OF SPECIES.

(The chief diagnostic characters are marked by an asterisk).

SPECIES.	SHAPE OF BODY.	LENGTH OF BODY.	MAXIMUM WIDTH.	WIDTH OF SEGMENTS.	NO. OF TURNS.	COLLARETTE.	SPINE-SCARS.	ANGLE OF RIBS.
F. dentata Renault and Zeiller	fusiform	*8-16 cm.	*1·5-2·5 cm.	*·5-1·0 cm.	*5	*NEAR ONE SUTURE, with DENTATE margin, 5-6 mm. wide	*·75-1·5 mm. dia. 1·5-3·0 mm. apart, *i.e.*, 10 occur in 32 mm.	15-30°
F. dentata Seward	broadly fusiform	8·0 cm.	2·7 cm.	·9 mm.	11	not preserved, but indicated by narrow grooves	*3 mm. dia. 10 occur in 10 mm.	15-30°
F. grandis Renault and Zeiller	cylindrical, narrowing at ends	*more than 40·0 cm.	*3·0-4·0 cm.	2·0-3·0 cm.	8-10	*margin ENTIRE, 5-8 mm. wide	2·3 mm. dia. 3·8 mm. apart, *i.e.* 10 occur in 60 mm.	45°
F. crenulata Moysey	cylindrical, tapering gradually	*more than 11·0 cm.	*5·0 cm.	2·1 cm.	2½	*margin CRENULATE, 12·75-15·0 mm. wide	2·0 mm. dia. 4·6 mm. apart, *i.e.*, 10 occur in 38 mm,	15°
F. moyseyi Pruvost	broadly fusiform	5·0 cm.	*1·4 cm.	·5 cm.	*more than 6	*ABOUT HALF-WAY BETWEEN SUTURES, but not clearly preserved	*1·0 mm. or less apart, 4-9 in 10 mm.	30°
F. sterzeliana Weiss	cylindrical, ends not tapering	7·0 cm.	*3·0 cm.	*6·0-10 cm.	3	near one suture, margin probably entire	1·0 mm. dia. 10 occur in 17·5 mm.	15°
F. warei Crookall	fusiform	5·6 cm.	*1·3 cm.	·4 cm.	7 or 8	*near one suture, margin entire, 2·5 mm. wide	*·25 mm. dia. less than ·25 mm. apart, *i.e.*, 9 occur in 5 mm.	15°

NEW BOOKS ON BIOLOGY.

Biological science is having a tremendous interest at the present time, and several books on the subject have recently been published. Among them is : **Modern Biology : A Review of the Principal Phenomena of Animal Life in Relation to Modern Concepts and Theories,** by **J. T. Cunningham.** London : Kegan Paul, Trench, Trübner & Co., xii.+244 pp., 10/6 net. The publishers inform us that ' The author maintains that the general theory of evolution now widely taught and accepted, based on Mendelism, unit characters, mutation, and natural selection, cannot be reconciled with many equally well-established facts of Biology, especially with metamorphosis, adaptation, and the dependence of secondary sexual characters on the internal secretions of the reproductive organs. In a lucid survey of the whole field he shows that the progress of recent research has brought to light numerous interactions in the organism which cannot be explained by mere changes in the hereditary units uninfluenced by the external environment. It is not enough to consider the hereditary unit or gene in the fertilised ovum, and the unit " character " in the adult to which it gives rise : it is necessary in modern biology to consider the processes of development and metamorphosis, and the extraordinary way in which these processes are influenced by internal secretions.' The book is well printed, and there is a good index.

Biology of the Vertebrates : A Comparative Study of Man and His Animal Allies, by **H. E. Walter.** London : Macmillan & Co., xxv.+788 pp., 21/- net. In this well illustrated volume we have the views of a prominent American biologist on the various aspects of biological science treated from an unusual standpoint, and, as is customary with publications emanating from the House of Macmillan, illustrations form a prominent part of the work. It is the result of twenty year's teaching, and the first part furnishes a necessary setting or introduction for the other two by emphasizing some of the outstanding features of various sister biological sciences most intimately related to Comparative Anatomy. They are Taxonomy, Chorology, Palæontology, Anthropology, Cytology, Histology, Embryology and Pathology. Part two deals with the mechanisms of metabolism and reproduction, including the integument, systems of digestion, circulation, respiration, excretion, and reproduction, together with the glands of internal secretion. Part three is concerned with the mechanisms of motion and sensation, which may be regarded as particularly characterizing animal organisms.

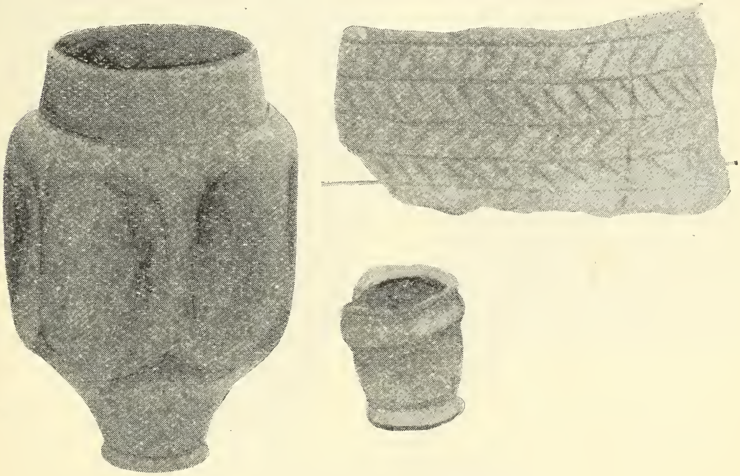
The Rate of Living, by **Raymond Pearl.** London : University of London Press, 185 pp., 10/6 net. Those interested in statistics and their bearing upon biological study will find this volume of exceptional interest. The author, by a series of experiments, considers the length of life depends inversely on the rate of living. The volume for the first time gives details of vital statistics of forms of life other than human.

Bisexuality : An Essay to read not once, not twice, but again and again, by **T. J. Faithfull.** London : John Bale, Sons & Danielsson 96 pp., 2/6 net. We have not read this once nor twice, nor again and again, but we can ask our readers so to do if they feel disposed. The author refers to Blake's Marriage of Heaven and Hell, and states ' Thus one portion of being is the Prolific (extroverted), the other the Devouring (introverted) ; to the Devourer it seems as if the Producer was in his chains ; but it is not so, he only takes portions of existence and fancies the whole. But the Prolific would cease to be prolific unless the Devourer as a sea received the excess of his delights. Some will say, " Is not God alone the Prolific ? " I answer " God only acts in existing beings or men." These two classes of men are always upon earth and they should be enemies, whoever tries to reconcile them seeks to destroy existence. Religion is an endeavour to reconcile the two.'

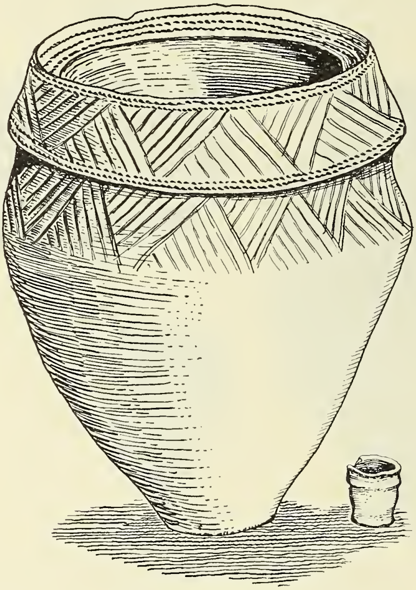
BRONZE AGE AND OTHER POTTERY FROM LINCOLNSHIRE, ETC.

T. SHEPPARD, M.Sc.

A Roman vase of exceptional size and beauty, recently found at Peterborough, has been obtained for the new Roman Gallery in the Hull Museum. It is 7 in. in height, 3¾ in. at its widest part, 3 in. across the mouth, and 1¾ in. wide at the base. The neck is 1¼ in. deep. The vase may be described as an indented beaker of black ware with a short conical neck and seven deep oval depressions occurring round the bulge. It is of the type in vogue A.D. 190-260.

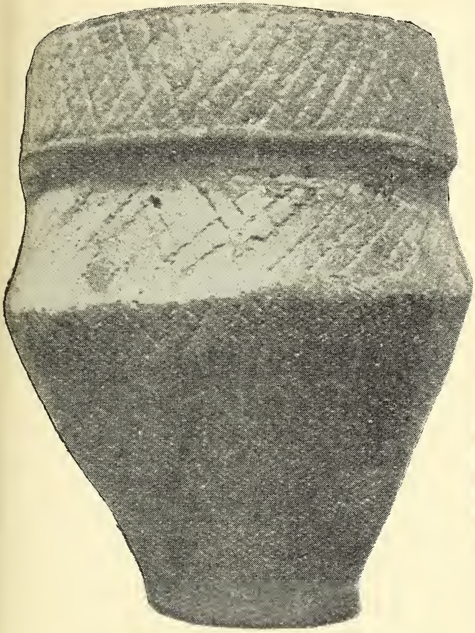


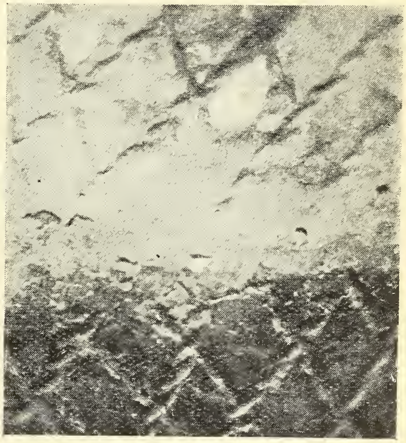
On the same photograph is a miniature cinerary urn of the Bronze Age recently found at Scunthorpe, Lincs. Occasionally small vessels of this kind occur in Bronze Age burials, but the precise purpose for which they were used is not known. Possibly they accompanied burials, because they merge into a larger class of miniature cinerary urns which were used just in the same way as ordinary food-vessels, or ordinary giant cinerary urns. For comparison, on the same photograph, is a portion of a large cinerary urn, also found close by the smaller vessel at Scunthorpe. The accompanying sketch, for which I am indebted to G. K. Beaulah, shows the relation between this small urn and one of the largest in the Mortimer Collection, which was dug up at Calais Wold in May, 1868, and is figure 425 in Mortimer's 'Forty Years' Researches.' The specimen figured herewith is not unlike one from Roxby, in the Greenwell collection now in the British Museum. It was found accompanied by ordinary-sized cinerary urns at Water Wold, E.R. Yorks. The British Museum collection has another tiny vase of the same kind from a barrow at Alwinton, Northumberland; this is mentioned in the description of Barrow CCV. (p. 428) in Greenwell's 'British Barrows.' The Museum authorities don't think we can really call these miniature cineraries 'toys'; they were evidently seriously intended to accompany burials because they merge into a larger class of miniature cinerary urns that were used in just the same way as ordinary food-vessels or ordinary giant cinerary urns. Of course, very tiny vases, like the one from Scunthorpe, could not have been intended for use, but they had just the same significance as an 'incense-cup' (whatever that may have been!)'



Also from Scunthorpe is a small cinerary urn, evidently for the remains of a small child. This is 5¾ in. at its widest part, and stands on a base 2½ in. across. It is well baked and in good condition. From the keel upwards, and also averaging half an inch below the keel, the clay has been pressed by a double cord, or, judging from the sharpness of the impressions, by a piece of twisted wire. These impressions are made trellis-wise, leaving irregular lozenge-shaped spaces averaging ½ in. in height and ¼ in. across.

Unfortunately, the upper rim or collar of the vase is missing, having probably been removed by the 'grab' used in excavating. We have, therefore, carefully restored it, basing the restoration upon other Lincolnshire examples in our possession, and the restoration may be taken as reliable. As the result the vase stands 6½ in. high, and is 4¾ in. across the mouth. Details of the twisting are given on the adjoining illustration.





As a cinerary urn the vessel is unusually small.

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Abundance of Coprinus comatus.—On September 10th Mr. S. D. Persy Fisher and the writer visited a field used as a cricket ground, off York Road, Leeds, where this fungus had been abundant for about a month. At the time of the visit there were more than a thousand plants spread over several hundred square yards, in every stage of development from 'buttons' to the decaying 'inkcap' state. The groundsman informs me that they have appeared every year since the ground was made up with cinders supplied by the Leeds Corporation four years ago, and that other grounds which were made up with the same materials are similarly infested with what he describes as a pest. He had to remove several barrow loads before the ground could be used for a match during the previous week-end.—F. A. Mason.

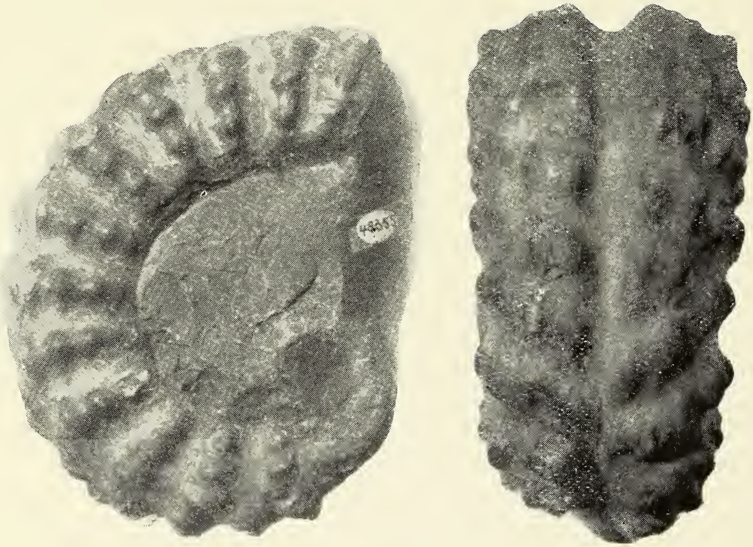
NEWS FROM THE PRESS.

The Daily News informs us that 'In an exhaustive report which he has just submitted to the Public Prosecutor at Moulins, M. Beyle, the Director of the Paris Judical Identity Service, and a man of the highest scientific repute, concludes that over 100 inscribed stones, objects fashioned from bones and articles of pottery, which were alleged to have been dug up on the so-called prehistoric station at Glozel, near Vichy, are of recent manufacture. He agrees that in many instances the faking was skilfully carried out, but he insists that his examination of them, which lasted nearly six months, and in the course of which he employed the latest violet rays and chemical methods for detecting fakes, has conclusively proved the objects submitted to him to be modern.' It seems ages since this conclusion was arrived at by many competent British archæologists.

W. Johnson, of Wath Rectory, writes to a Leeds evening paper :—'The strata at the summit of Oliver's Mount (Scarborough) are found to agree with some 60 feet below the surface of the Castle Hill. If the Castle Hill, therefore, were in its original position, its surface would be 60 feet higher than Oliver's Mount. What a magnificent object it would have been ! This landslide must have occurred in prehistoric times and possibly was caused by the weight of ice which flowed over the neck of the promontory in the Ice Age. The striæ which are to be found on the rocks of Filey Brigg when the boulder clay is washed away would, I think, agree with the direction of flow. In the middle of the strata exposed on this part of the coast is found the lias shale, a slippery sort of rock, which, when affected by percolating water, will easily be moved from its original position, as has already been proved on the Marine Drive.' Lias on the Marine Drive !

As the following occurs in *The Bradford Telegraph*, it must be looked upon as a true story, although signed G.B. : 'Through one part of a friend's gardens flows a tributary of the Aire, and one day while he was digging a sudden swirling and splashing in the stream caused him to turn round. There he saw a large speckled trout lashing about in an attempt to get a hook out of its mouth. Hurrying to the bank he beckoned to it, and it came tremulously to him for succour. To cut a long story short, he took out the hook, and for long after that the grateful fish made a habit of swimming by his garden each morning and performing little tricks for his benefit. Even when he and his friends went ratting along the river bank the fish would swim alongside and retrieve the dead rats as they shot them. More than that, it would even act as a pointer, and, darting through the water on a hot scent, would suddenly stop with its nose pointing to a rat hole which, perhaps, would be hardly visible from above the surface. Returning from a three weeks' holiday, my friend was surprised to see something peculiar lying on his front door step. This turned out to be about a dozen rat skulls, and he was at a loss to account for it, when suddenly he was startled to hear a loud splash and then a series of "flops" on the macadam path. Turning, he saw the poor fish, bleeding profusely from all its fins, and dragging up the path a huge rat, quite dead, which it held by the tail. Gasping out its life, it tried to place the corpse at his feet, and then, rising on its tail, and with the last despairing gasp, tears streaming down its gills, and the horrid marks of its encounter gaping on its tortured body, the poor creature bestowed one brave smile upon its benefactor and collapsed.' [We do not wish our readers to try to tell a bigger one.—Ed.]

Professor A. P. Laurie writes on 'Stone Preservation and Decay' in No. 9 of Volume XXXV. of *The Journal of the Royal Institute of British Architects*. A report of the discussion thereon, *in extenso*, is also given.



Tylonautilus nodiferus (Armstrong) from 'Millstone Grit' of Claughton Brickworks, near Lancaster. About ⅔ nat. size. Coll. M.P.G. 48355.

TYLONAUTILUS NODIFERUS gen. nov. = (NAUTILUS (DISCITES) NODIFERUS Armstrong): A CARBONIFEROUS GUIDE FOSSIL.

J. PRINGLE, F.G.S. AND J. WILFRID JACKSON, M.Sc., F.G.S.

PLATE XI.

IN 1866, Armstrong[1] figured and described a nautiloid under the name of *Nautilus* (*Discites*) *nodiferus*, and he remarked that the shell formed a useful index to the upper division of the Carboniferous Limestone Series of Clydesdale. Later researches in these rocks in the west of Scotland have confirmed the accuracy of Armstrong's observation and have further shown that the shell is confined to and is characteristic of a narrow zone, which includes the Arden and Castlecary Limestones. But while its vertical range is narrow, the discovery of specimens over a wide area in the north of England by the writers and other workers shows that the species also had a wide horizontal distribution. It is, therefore, an ideal shell for purposes of correlation, and we propose in this contribution to give Armstrong's description of the shell accompanied by a figure of a typical example of the species; to suggest that it be placed in a new genus, and afterwards to show the position it occupies in the zonal scheme, based on the goniatite succession put forward by Mr. W. S. Bisat.[2]

Armstrong's description of the shell is as follows:—'Shell discoidal, composed of about three gradually enlarging, contiguous, nearly subquadrate whorls, completely exposed in a moderately shallow umbilicus; back broad, rounded at the edges, and traversed in the middle by a wide and deep channel, on the sloping sides of which are two fine thread-like ridges. The remainder of the space on the back and sides of the shell is occupied by six rows of closely set, prominent, obtuse tubercles, elongated in the direction of the aperture, one row of tubercles of large size bounding the back, a double row of equal size between it and the channel, and three on the sides, which decrease in size towards the umbilicus. Surface marked with coarse, squamose, wavy lines of growth which are arched backwards in the dorsal [ventral or peripheral] channel. Septa numerous, their edges arched considerably backwards on the periphery, and slightly so at the

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[1] Armstrong, J. 'Description of two new species of shells from the Carboniferous Limestone of Clydesdale.' *Trans. Geol. Soc. of Glasgow*, Vol. II., 1866, pp. 74, 75, Pl. I., figs. 6 and 7.

[2] 'The Carboniferous Goniatites of the North of England, and their zones.' *Proc. Yorks. Geol. Soc.*, Vol. XX., Part 1, 1924.

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sides. Siphuncle $\frac{1}{12}$ inch diameter, central. Dimensions—width of greatest diameter $3\frac{1}{4}$ inches, width of outer whorl near the aperture, 1 inch.' To this excellent description we might add that the specimen figured by ourselves on Plate XI., and a well-preserved example from Caton, now in the British Museum (Natural History), are complete to the mouth border and each shows a perfect hyponomic sinus.

Armstrong's shells are now in the collections of the Royal Scottish Museum, Edinburgh. The large specimen forming fig. 6 of his paper is labelled 'Arden,' and is registered as 1884. 46. 895. The other shell depicted in fig. 7 is labelled 'Westerhouse,' and registered as 1884. 46. 886.

A. H. Foord[1] regarded *Nautilus nodiferus* as a synonym of Roemer's *Pleuronautilus nodosocarinatus*. After a careful study of the German shell,[2] we cannot agree with his verdict. The nodose ornament of the strong radial ribs on Armstrong's shell, the absence of spiral ornaments on the flanks and the deep sulcus on the periphery, all readily serve to distinguish the Scottish shells from the German examples. Our study confirms the opinion expressed by Dr. G. W. Lee many years ago that *N. nodiferus* is a distinct species.

Further, we consider that *N. nodiferus* should no longer remain in the genus *Pleuronautilus*, which was proposed by Mojsisovics[3] for Triassic shells. The original diagnosis was slightly amended by Foord,[4] so as to include in it certain Carboniferous nautiloids. While Armstrong's shell undoubtedly falls within the *Pleuronautilidæ*, it possesses such marked characters as to warrant raising it to generic rank. Accordingly, we propose the name of *Tylonautilus* for such forms.

Diagnosis : Moderately evolute thick discoid shells with shallow umbilicus. Whorls contiguous and nearly subquadrate in section with a deeply sulcated periphery. Ornament consists of prominent radial nodose ribs, discontinuous at the sulcus and narrowing towards the umbilicus. Suture simple, arching considerably backwards on periphery and slightly so at sides.

Genotype : Shell forming Fig. 6 of Armstrong's paper. Reg. No. 1884. 46. 895. Royal Scottish Museum, Edinburgh.

Horizon and Locality : Arden Limestone, Arden Quarry, Nitshill, Lanarkshire.

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[1] 'Catalogue of the Fossil Cephalopoda in the British Museum,' Part II, London, 1891, pp. 139-140.

[2] Zeitschr. der Deutsch. geol. Gesellsch. Band XV., Taf. XIV., f.f. 8a-c, 1863, and Geologie von Oberschlesien, Taf. VIII., f.f 19, 20.

[3] 'Die Cephalopoden der Mediterranen Triasprovinz,' *Abhandl. der k-k geol. Reichsanst.* Band X., 1882, p. 273.

[4] *Op. cit.*, p. 134 (footnote 2).

DISTRIBUTION.

SCOTLAND.—Examples of *Tylonautilus nodiferus* have been recorded from either the Arden or Castlecary Limestones at the following localities in the west of Scotland ; Arden Quarry, Nitshill ; Balmuildry ; quarry north-east of Barmalloch, Hogganfield ; Castlecary ; railway-cutting at Chryston, near Coatbridge ; Cumbernauld ; Darnley ; East Kilbride ; Gare, near Carluke ; Garnkirk ; Garngad Road, Glasgow ; Robroyston ; Thornliebank ; Waukmill Glen and Westerhouse, near Carluke. Many fine specimens are exhibited in the Kelvingrove and Hunterian Museums, Glasgow, and in the Royal Scottish Museum, Edinburgh, both in the Armstrong and Geological Survey collections. The species does not appear to have been recorded from the Upper Limestone series of East Lothian or Fifeshire.

ENGLAND.—In Cumberland a specimen was collected by Mr. A. Templeman from the Snebro Gill Beds, near Whitehaven, and identified by one of the writers as *Pleuronautilus* cf. *nodosocarinatus* Roem.,[1] and also from a limestone, believed by Messrs. Trotter and Hollingworth to be approximately at the horizon of the Corbridge Limestone near the head of Crook Burn, Geltsdale.[2] Further research at this locality, however, may show that the limestone is the Thornboro' Limestone, which lies about 80 ft. higher in the sequence.

In Northumberland, Dr. Stanley Smith has collected numerous specimens from the Thornboro' Limestone at Styford. These are now in the collections of the British Museum (Natural History). In connection with its occurrence in this limestone, Mr. A. Templeman has obtained a goniatite, which may prove to be a species of *Eumorphoceras* from the Thornboro' Limestone of Wydon Nab, South Tyne. Messrs. Hedley and Waite also have kindly given us records of the occurrence of *T. nodiferus* from Styford, and from the Harlow Hill Limestone at Cross Edge quarry, one mile north of Newton village, and at Stob Hill quarry, near Stamfordham.

In Lancashire, *T. nodiferus* has been found in the Lower Sabden Shales of Sales Wheel, on the Ribble at about the horizon of the *Bisulcatum*-bed, the middle of Zone E of Mr. Bisat's classification. It is recorded from the Millstone Grit of Caton, near Lancaster. The precise zone is unknown as yet, but it is probably low in the equivalent there of the Sabden Shales. A good specimen, now in the Sedgwick

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[1] A Sketch of the Geology of the Whitehaven District.' *Proc. Geol. Assoc.*, Vol. XXXVI., 1925, p. 45.

[2] ' On the Upper Limestone Group and " Millstone Grit " of North East Cumberland.' *Summary of Progress of the Geological Survey for 1926*. 1927, p. 102.

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Museum, Cambridge, from the same locality, was figured by Mr. A. H. Foord.[1] The shell here depicted on Plate XI., is from the Millstone Grit Shales of Claughton Brickworks, near Lancaster. It was collected by R. H. Tiddeman, and is now in the Museum of Practical Geology (Reg. 48355).

In Yorkshire the species is known to occur in the Yoredale Series of Swaledale. In the Little Limestone (above the Main Limestone) at Smith's Gill, Hawes area, and in the Cayton Gill Beds. In the British Museum (Natural History) there is a finely preserved shell from the Carboniferous shale-beds of Harrogate. This was discovered in the thick shales that have been intersected in the formation of the Corporation new reservoir at Scargill, about four miles west of the borough.[2]

In Derbyshire, *T. nodiferus* has been found by one of the writers in the Edale Shales at Edale in shales that lie just below the *Bisulcatum*-bed about the middle of Zone E.[3]

In the South-west Province the shell does not appear to have been recorded. Along the north crop of the South Wales Coalfield, Zone E is unrepresented, but it may possibly be found in the Gower peninsula, where the sequence is more complete.

Generally, it can be seen from the above localities that *Tylonautilus nodiferus* occurs within Zone E of Mr. Bisat's classification of these rocks. The precise level appears to be just below the *Bisulcatum*-bed as is indicated in those instances where goniatites have been found in association with the nautiloid. Evidence obtained from the fauna of the overlying rocks also points to a position in Zone E, and in this connection the fossils of the shales which lie about 30 ft. above the Castlecary Limestone should be considered. These beds form the lower part of the Scottish Millstone Grit, and in the Garngad Road section at Glasgow they have yielded a rich fauna. Hind,[4] in describing the lamellibranchs and gasteropods, referred to the presence of certain goniatites. These have since been examined by Mr. Bisat,[5] who in identifying them as *Anthracoceras glabrum*, concluded that the shales should be high in Zone E, or low in H. He was also struck by the resemblance of the lamellibranch fauna to that of the Cayton Gill Beds.

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[1] On *Pleuronautilus* [*Nautilus*] *nodosocarinatus* (Roem). *Geol. Mag.* Dec. 3, Vol. VIII., 1891, p. 481.

[2] See *Yorkshire Weekly Post*, Jan. 13, 1900, p. 10 (with figure).

[3] Jackson, J. W. 'The Succession below the Kinder Scout Grit in North Derbyshire.' *Journ. Manch. Geol. Assoc.*, Vol., I., Part 1 (1925-26), 1927, p. 28 (footnote).

[4] Hind, W. 'On the Lamellibranch and Gasteropod Fauna found in the Millstone Grit of Scotland.' *Trans. Royal Soc. Edin.*, Vol. XLVI., 1908, p. 331.

[5] Bisat, W. S. *Op. cit.*, p. 55.

In West Cumberland the Snebro Gill Beds are overlain unconformably by the *Cumbriense* Zone, so that a test there cannot be applied ; but in West Northumberland the Thornboro' Limestone has yielded a poorly preserved shell of *Eumorphoceras*, and in this area and in East Cumberland the limestone is followed upwards by a grit and the Lower and Upper Fell Top Limestones. These calcareous beds are characterised by a fauna closely identical with that of the shales at Garngad Road. In addition to the lamellibranchs, the assemblage is made up of many similar species of brachiopods, including the finely ribbed *Productus*, which has been identified as *P.* cf. *cora* d'Orb.[1] It is highly probable that the two Fell Top Limestones are equivalent to the fossiliferous shale in the lower part of the Scottish Millstone Grit, and are possibly therefore high in Zone E.

The late Dr. Kidston came to the conclusion that the lower third of the Scottish Millstone Grit, so far as the fossil plants are concerned, must be considered as of Lower Carboniferous age, and one of us[2] has shown that in Zone E Lower Carboniferous plants are present at Edale. J. Holmes and W. S. Bisat[3] have also recorded typical Lower Carboniferous plants from Keasden Beck, near Clapham, Yorkshire, in association with a marine band indicating high position in Zone E.

The evidence brought forward in this paper adds further support to that already published elsewhere regarding the synchronism of the Upper Yoredalian and Lower Lancastrian. The establishment of this fact raises the question of the dividing-line between the Lower and Upper Carboniferous. The great break in the flora between these two divisions (=the base of the late Dr. Kidston's Lanarkian) seems to occur either in Upper E or Lower H of Bisat's Lancastrian. This is well above the line of demarcation adopted by Bisat on goniatite-faunal evidence. The dividing-line based on the flora, however, appears to agree with the continuance, in the Carboniferous Limestone Series of the North of England and Scotland, of many typical and characteristic Avonian fossils up to the level adopted by Kidston.

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[1] In additon to the lists given by W. Hind, *op. cit.*, see also ' The Geology of the Glasgow District.' *Mem. Geol. Surv. Scotland*, 1925, p. 84 ; lists of fossils by J. Pringle in appendix ' On the Upper Limestone Group and " Millstone Grit " of North East Cumberland.' *Summary of Progress of Geological Survey for 1926*. 1927, p. 102.

[2] Jackson, J. W. *Op. cit.*, pp. 27-28. See also forthcoming Presidential Address to Manchester Geol. Association for reference to *Calamites* of intermediate-type in the pre-*reticulatum*-zone at Roughlea (Upper Sabden Shales. Similar forms occur in shale below Castlecary Limestone.

[3] Holmes, J. and W. S. Bisat. *The Naturalist*, 1925, pp. 307-312.

We have to thank the Curators of the Glasgow and Edinburgh Museums for allowing us to examine the specimens in their charge, and to acknowledge the valuable assistance of other workers who have freely given us information concerning the occurrence of *T. nodiferus* in Scotland and the north of England.

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T. A. Coward writes on 'The "Wing-clapping" of the Nightjar,' in *British Birds* for November.

'Wordsworth as a Pioneer in the Science of Scenery,' one of the addresses given by Dr. Vaughan Cornish at the Conference of Delegates at the Glasgow Meeting of the British Association, appears in *Nature*, No. 3075.

The Scarborough Field Naturalists' Society has issued a *List of Birds of the Scarborough District*, by T. N. Roberts (8 pp.). This district is taken as the area from Flamborough Headland to Whitby on the south and north, and Weaverthorpe on the west. Various authorities seem to have been consulted, and, so far as we can see, the list is very full, and creditable to the Society and its Recorder.

The North Western Naturalist for the September quarter includes much interesting information, including the following: 'Mayflies,' by J. G. Parker and W. G. Bainbridge; 'Some Observations on the Fluctuations of Certain Injurious Species,' by C. L. Walton; 'Notes on Lakeland and Solway Firth, 1926,' by Ritson Graham; 'The Altitudinal Range of Flowering Plants and Ferns in Mid-Wales,' by J. H. Salter; 'Variable Local Distribution of Corixidæ,' by H. R. P. Collett.

The Journal of the Manchester Geographical Society, recently published, besides a 'Foreword' by the President, Colonel E. W. Greg, contains four monographs of peculiar value to those interested in the geography of the Manchester area. These are 'The Geographical Basis of the Manchester Cotton Industry'; 'Towns of South-east Lancashire'; 'Agricultural Geography of Lancastria'; and 'The Ribble Basin.' These are by H. W. Ogden, W. H. Barker, H. King, and W. Fitzgerald respectively.

The quarterly number of *The Vasculum* for October contains a good list of papers, including 'A Lowly Plant and its Ways,' by Kathleen B. Blackburn; 'The Birds of Jarrow Slake,' by C. Noble Rollin; 'Floral Variation in the Fragrant Orchid (*Gymnadenia conopsea* L.),' by Helena Heslop Harrison; and the following by J. W. Heslop Harrison: 'A Hunt for the Yellow Horned Moth'; 'Pollination of *Habenaria gymnadenia* Dr. (*Gymnadenia conopsea* L.) and other Orchids'; and 'Two new Aberrations in our Local Lycænids: *Aricia medon* ab. *carteri* and *Polyommatus icarus* ab. *carteri*.'

We see from *The Library Assistant* that during a discussion on the relationship of Libraries and Museums recently held at the Library Association Conference at Blackpool, 'Mr. Deas endeared himself to the majority of his audience by his remark that the Librarian was better fitted for the dual roll of Librarian and Curator than was the Curator.' As a Librarian, trained as a Librarian, who subsequently took over the Museum at Sunderland, and speaking to Librarians, Mr. Deas certainly had a sympathetic audience. One wonders if he would have the same unanimous approval had he made a similar remark when addressing the Museums Association a little while ago. Unfortunately for his ideal, the Leicester Corporation not long ago gave their Museum Curator, Dr. E. E. Lowe, the additional duties of Chief Librarian, and we do not look upon the Leicester Corporation as devoid of brains.

YORKSHIRE NATURALISTS AT CAWTHORNE.

W. H. PEARSALL, D.Sc., F.L.S., AND F. A. MASON, F.R.M.S.

THE three hundred and forty-second meeting of the Yorkshire Naturalists' Union was held at Cawthorne, near Barnsley, for the investigation of Cannon Hall Park and the adjacent woodlands, on Saturday, July 7th. The fine weather was enjoyed by a large number of members, led by Mr. B. Morley. At the meeting in the evening, Dr. T. W. Woodhead presided, and two new members were elected. Votes of thanks were accorded to Mr. W. E. L. Wattam, who had made the local arrangements ; to Mr. B. Morley, as leader ; and to the landowners who had given permission to visit their estates.

GEOLOGY (H. Wade) :—The Geological Map shows outcrops in the parish of a regular sequence of the lower seams of the Middle Coal Measures, with the uppermost seam of the Lower Coal Measures—the Whinmoor Bed.

The seams in descending order are : Joan Coal, Flockton Coal, Parkgate Coal, Swilley Coal, Silkstone 4-foot Coal, Silkstone Coal, Whinmoor Coal. Between them are Sandstones and Shales, and the central part of the village is on the Sandstone between the Parkgate and Swilley Seams.

The Joan Coal is supposed to crop out in Cawthorne Park, at the north side of the parish ; the Flockton Coal at the extreme north-east corner ; then, coming westwards, the Parkgate, just east of the village ; Swilley Coal crops out right through village, almost under the museum. Then follows the Silkstone 4-foot Coal, only a short distance further west, owing to the rapid fall of the surface into Tivy Dale, the Silkstone seam appearing next, in Tivy Dale, and lastly, the Whinmoor in Banks Bottom.

The outcrop, the highest seam, Joan Coal, is east and west, and owing to the contour of the district, the outcrops of the following seams assume a north-west and south-east line, gradually attaining to a north and south line in the Silkstone seam, and again resuming the east and west line in the case of the Whinmoor seam.

Sandstone areas occur round Barnby Hall and Green at the extreme east of the parish ; the centre of the village ; and in Cannon Hall Park crossing over to east side of Tivy Dale, and from thence extending towards the southern border of the parish.

VERTEBRATE ZOOLOGY (J. C. S. Ellis) :—In and near the lake were seen the Mute Swan, Kingfisher and Mallard, two or three broods of young of the latter being evident. The presence of the hill-stream-loving Grey Wagtail by the lake suggested very early autumnal movements. The Spotted Fly-catcher was in the park, and Mr. F. A. Mason saw the Pied Fly-catcher, stated by Nelson to breed annually here. The keeper's gibbet contained only a number of Jays, but a dead Magpie was seen in Margery Wood. Chiff-chaffs, Willow Warblers, and a Gold crest were heard, and a single Wood-warbler seen. Mr. Morley reports also the Garden Warbler, Tree Pipit and Common Whitethroat.

MOLLUSCA (Mrs. E. M. Morehouse) :—The lakes of the Cannon Hall estate appeared very clean, few aquatic plants being seen, with the exception of the yellow water-lily. This might account for the scarcity of freshwater mollusca, only four species being observed. *Anadonta cygnea, Pisidium pusillum, Planobris albus, Paludestrina jenkinsi,* the last species being quite plentiful in the upper lake. The land mollusca were very few, only *Pyramidula rotundata, Hygromia hispida, Hyalinia alliaria, Helix hortensis* being taken. Three slugs were seen, *Limax maximus, Arion ater* and *Agriolimax agrestis.*

From the old canal the following were taken, *Succinea elegans, Bithynia tentaculata, Planorbis umbilicata, Limnea peregra, Paludestrina jenkinsi,* and by the side, *Pyramidula rotundata.*

The absence of land shells might be due to the dry, warm, sunny day.

Entomology (J. M. Brown) :—The ground was covered at too rapid a rate to allow intensive entomological work to be done, but having lost touch with the main party, the greater part of my time was spent in Deffer Wood. A wood of this type does not promise anything very remarkable in insect life, many of the older trees having been cut, and their place occupied by young plantations of larch and pine. The ground flora, also, was not very varied. No time was given to searching for ground insects, and the afternoon spent in sweeping and beating oak, birch and pine did not produce any very interesting finds.

No butterflies were noticed, and moths, bees and wasps were scarce. Several Neuroptera were taken, including *Hemerobius nitidulus* Fabr., *H. humuli* L., *Chrysopa flava* Scop., *C. alba* L., *Coniopteryx tineiformis* Curt., and the variety *curtisiana* End.

The Psocoptera were very scarce indeed, two species only being found, viz., *Mesopsocus unipunctatus* Müll. and *Elipsocus cyanops* Rost.

The Hemiptera were not as plentiful as might have been expected, the oaks yielding few species. The most interesting was *Dichrooscytus rufipennis* beaten from Scots Fir. As we have no previous records for this wood, the full list is given :

Heteroptera.

Anthocoris confusus Reut.
Pithanus mærkeli H.S.
Dichrooscytus rufipennis Fab.
Capsus ater L.
Stenodema calcaratum Fall.
Monalocoris filicis L.
Dicyphus stachydis Reut.
Cyllocoris histrionicus L.

Homoptera.

Philænus spumarius L.
Batrachomorphus lanio L.
Deltocephalus abdominalis Fab.
Thamnotettix prasinus Fall.
Cicadula 6-notata Fall.
Eupteryx auratus L.
E. stachydearum Hdy.
Cixius brachycranus Fieb.
Conomelus limbatus Fall.
Delphax discolor Boh.
Dicranotropis hamata Boh.
Psyllopsis fraxini L.
Psylla alni L.
P. mali Sch.
Trioza urticæ L.

Coleoptera.—It is of interest to compare the list of beetles obtained with that given by Mr. Bayford in *The Naturalist* (1909, p. 394) for the previous visit of the Union to Cawthorne, when it will be seen that only one insect is common to the two lists. Ground beetles were not looked for on this occasion. The evening spent by the canal side produced numerous specimens of *Donacia semicuprea* on *Glyceria aquatica*, with which the canal is choked, a species found under the same circumstances by Mr. Wattam on July 14th. Two longicornes were taken by Mr. L. Taylor, *Strangalia armata* in Margery Wood, and a fine specimen of *Stenochorus meridianus* in the village. This last seems to be new to the district. The following were taken :

Amara plebeia Gyll.
Tachyporus obtusus L.
Baptolinus alternans Gr.
Aphodius ater De G.
Agriotes pallidulus Ill.
Dolopius marginatus L.
Helodes minuta L.
Cyphon coarctatus Payk.
Rhagonycha limbata Th.
Malthinus flaveolus Payk.
Malthodes marginatus Latr.
M. minimus L.
Stenochorus meridianus Panz.
Strangalia armata Hbst.
Donacia semicuprea Panz.
Cryptocephalus labiatus L.
Crepidodera transversa Mars.
Otiorrhynchus picipes Fab.
Phyllobius pomonæ Ol.
P. argentatus L.
P. viridicollis F.
Cidnorrhinus 4-maculatus L.
Anoplus plantaris Næz.
Rhynchites nanus Payk.

DIPTERA.—Chris. A. Cheetham writes :—Deffer Wood provided good ground for Diptera, the streamlets have cut deep into the shales, and their banks are covered with vegetation, the bottoms being sometimes boggy with plenty of decaying timber.

The date was rather late for some of the Syrphids, and may be the cause of their scarcity in the list. Tipulids were few, and hopes of some of the rarer woodland species were not realized. An Empid, *Trichopeza longicornis* Mg., which seems very uncommon elsewhere in Yorkshire, was here abundant, and this and *Euthyneura gyllenhali* Ztt. were both taken at Coxley on similar ground and in the same Vice-County. Among the Dolichopods the silvery Argyras were plentiful, four species being caught, and another interesting capture was *Loxocera sylvatica* Mg.

The asterisk denotes additions to the County list.

**Phorodonta* (*Sciara*) *flavipes* Mg.
Sciara caudata Wlk. (*longiventris*) Ztt.
Dynatosoma fuscicorne Mg.
Mycetophila vittipes Ztt.
Acnemia nitidicollis Mg.
Neuratelia (*Anaclinia*) *nemoralis* Mg.
Boletina trivittata Mg.
Tetragoneura sylvatica Curt.
Mycomyia (*Sciophila*) *cinerascens* Ztt.
Macrocera fasciata Mg.
M. angulata Mg.
Scatopse inermis Ruthé (*Psectrosciara soluta* Lw.).
Simulium ornatum Mg.
Stilobezzia gracilis Hal.
Palpomyia semifumosa Goet.
Ptychoptera contaminata L.
Dicranomyia modesta Mg.
Rhiphidia maculata Mg.
Molophilus appendiculata Stæg.
M. bifilatus Verr.
M. bifidus Tonn.
M. flavus Tonn.
Ormosia nodulosa Meij.
Erioptera diuturna Wlk.
Ephelia marmorata Mg.
Limnophila fulvonervosa Mg.
L. ochracea Mg.
L. placida Mg.
Adelphomyia senilis Hal.
Tricyphona occulta Mg.
Dolichopeza sylvicola Curt.
Pachyrrhina quadrifaria Mg.
Tipula scripta Mg.
T. fulvipennis Deg. (*lutescens* F.).
Beris vallata Fstr.
B. chalybeata Fstr.
Chrysophilus cristatus Verr.
Hybos femoratus Müll.
Hilara intermedia Fal. (*pubipes* Lw.).
H. litorea Fal.
Trichina clavipes Mg.
Ocydromia glabricula Mg.
Œdalea holmgreni Zett.
Clinocera wesmælii Mcq.
**Chelifera diversicauda* Coll.
**C. concinnicauda* Coll.
Tachydromia lutea Fal.
T. ciliaris Fal.
T. verralli Coll.
Trichopeza longicornis Mg.
Euthyneura gyllenhali Ztt.
Dolichopeza popularis Wied.
D. plumipes Scop.
Hypophyllus obscurellus Fal.
Gymnopternus cupreus Fal.
Chrysotus cilipes Mg.
Argyra argyra Mg.
**A. confinis* Ztt.
A. argentina Mg.
A. leucocephala Mg.
Xiphandrium appendiculatum Ztt.
Lonchoptera tristis Mg.
Callimyia speciosa Mg.
C. amœna Mg.
Chalarus spurius Fal.
Baccha elongata F.
Sphegina clunipes Fal.
Eristalis horticola Deg.
Xylota segnis L.
**Ptychoneura rufitarsis* Mg.
Lucilia cæsar L.
Phaonia tinctipennis Rnd.
P. basalis Ztt.
P. scutellaris Fal.
Allœostylus diaphanus Wied.
A. sudeticus Schn.
Mydæa tincta Ztt.
M. pagana F.
Hebecnema nigricolor Fal.
Spilogona denigrata Mg.
Macrorchis meditata Fal.
Lasiops mutatus Fal. (*Trichopticus semipellucidus*).
Hylemyia flavipennis Fal.
Anthomyia pluvialis L.
**Fannia monilis* Hal.
F. coracina Lw.

Fannia serena Fal.
Azelia macquarti Stæg.
A. cilipes Hal.
Coenosia intermedia Fal.
C. tricolor Ztt.
C. linteaipes.
*_Chirosia crassiseta_ Stein.
Scatophaga maculipes Ztt.
Suilla (*Helomyza*) *notata* Mg. (*pectoralis*)
,, ,, *fuscicornis* Ztt. (*montana* Lw.)
,, ,, *pallida* Fal.
,, ,, *lævifrons* Lw.
Allophyla atricornis Mg.
Blepharoptera serrata L.
Dryomyza flaveola F.
Neuroctena analis Fal.
Tetanocera lævifrons Lw.
Loxocera sylvatica Mg.
Lonchæa chorea F.
Palloptera umbellatarum F.
Peplomyza wiedemanni Lw.
Sapromyza inusta Mg.
S. rorida Fal.
S. sordida Hal.
S. decempunctata Fal.
S. præusta Fal.
Lauxania ænea Mg.
Sepsis cynipsea L. (Collin).
Parhydra quadripunctata Mg.
Chlorops speciosa Mg.
Chætoneurophora thoracica Mg.
Dohrniphora concinna Mg.

FLOWERING PLANTS (W. H. Pearsall) :—The district showed very typical Coal Measure vegetation, originally mostly of the dry oakwood type, but containing some extensive patches characterised by a high water level and somewhat clayey soil. On these *Milium effusum* was dominant over large areas beneath the trees, and more extensively than is usual in woodlands of the Coal Measure type. The woods had been heavily planted, and *Quercus ilex* was very abundant in the park. Few species were observed which were not included in the circular, but both *Potamogeton pectinatus* and *Myriophyllum spicatum* occurred in the lake.

BRYOLOGY (W. H. Burrell) :—A special look-out was kept for *Orthodontium gracile* in order to map its distribution in Yorkshire. Mr. Cheetham secured it on rotten wood in Deffer Wood, and I had it on living oaks in Margery Wood and at Denby Dale—a useful link between Penistone, Holmbridge, Coxley, Doncaster and Fenwick. Bryophytes were not much in evidence, and most of those obtained are of very general distribution. They include *Dichodontium pellucidum, Dicranoweisia cirrata, Barbula convoluta, Bryum cæspiticium, B. argenteum, Eurhynchium crassinervium* and *Amblystegium juratzkanum.*

LICHENS (W. E. L. Wattam) :—Cawthorne and its immediate neighbourhood has already received much attention, but my investigations are not yet completed. It is, however, particularly noticeable how devoid are the trees in the extensive range of woodlands, and in Cannon Hall Park, of foliose and fructicose species. Forms of the latter species are best represented by the Cladonias. Up to the present the following species have been noted. The wall habitat mentioned is of local sandstones.

Parmelia physodes Ach. Old tree stumps and walls.
P. saxatilis Ach., and its form *furfuracea* Schær. Similar habitats.
P. sulcata Tayl. Not common, walls.
Xanthoria parietina Th. Fr., with its var. *aureola* Th. Fr., and its form *congranulata.* Walls.
Candelariella vitellina Müll.-Arg. Old palings, walls and their earth crevices.
Lecanora muralis Schær. Walls and tree boles.
L. campestris B. de Lesd. Walls.
L. subfusca Ach. Sparingly, boles of Mountain Elm.
L. galactina Ach. Mortar of walls.
L. varia Ach. Old palings.
L. symmictera Nyl. Tree boles.
L. conizæa Nyl. Tree boles.
L. sulphurea Ach. Walls.
L. atra Ach. Walls.

Lecanora parella Ach. Walls.
Cladonia pyxidata Hoff. Among mosses and humus on old tree stumps.
C. fimbriata Fr. Among mosses.
C. gracilis Willd. Among mosses.
Lecidia contigua. Boulders in streams.
L. coarctata Nyl. with its var. *elacista* Cromb. Walls.

PLANT GALLS (J. M. Brown) :—These occurred in some number, but opportunity for close work was wanting, and only the most obvious ones could be noted. The following list includes those obtained by Miss Pilkington.

On Ash, *Psyllopsis fraxini* L. ; on Elder, *Epitrimerus trilobus* Nal. ; on Hawthorn, *Aphis cratægi* Buck. ; on Gooseberry, *Rhopalosiphum ribis* Koch. ; on Dock, *Aphis rumicis* L. ; on Convolvulus, *Eriophyes convolvuli* Nal. ; on Alder, *Eriophyes nalepi* Fock., *E. lævis* Nal. ; on Lime, *Contarinia tiliarum* Kief. ; on Meadow-sweet, *Perrisia ulmariæ* Bremi. ; on Nettle, *Perrisia urticae* Perris. ; on Male Fern, *Anthomyia signata* Br. ; on Nettle, *Trioza urticæ* L. ; on Oak, *Neuroterus baccarum* L., *Dryophanta divisa* Hart., *Cynips kollari* Hart., *Macrodiplosis dryobia* Löw.

On Wild Cherry occurred a particularly fine and curiously formed 'Witches' Broom.' This form seems characteristic of this tree ; similar ones of equally large size, also on Wild Cherry, are frequent in some of the woods in North Derbyshire.

——:o:——

YORKSHIRE NATURALISTS' UNION :

ANNUAL MEETING OF THE BOTANICAL SECTION.

THIS section met at the University of Leeds on October 13th. Professor Priestley, who had kindly invited and welcomed the members to the new rooms of the Botanical Department in Beechgrove Terrace, said that the meeting was really a 'house-warming,' being the first occasion on which the room had been used. He considered the annual meeting to be almost a family party, such a friendly spirit being invariably in evidence.

The annual reports of the Secretary and the convenors of the Committees were submitted, and nominations were made for officers and committees for 1929.

A communication from Mr. R. J. Flintoff next provided matter for serious consideration,. He had on previous occasions pointed out the unsatisfactory state of the plant records of the three Ridings, and at last year's meeting an effort was made to get the arrears into print, and recorders were appointed for this purpose. The recorders now stated that the matter was in a form that would make it an easy task, if it could be decided how and when publication could be undertaken ; this has been held up awaiting the proposed memorial volume to our late Secretary, J. Fraser Robinson. Mr. Stainforth stated that he did not think the memorial could be put in hand for some months yet, and consequently the question of publication is still in an indefinite state. Mr. Flintoff pointed out that, although he had been appointed recorder, no one had sent him any records, and he understood that new plants had been seen but not reported to him. After a discussion and suggestions the meeting decided that the present rather unwieldy Botanical Survey Committee should be divided into (*a*) a Records' Committee to deal with the systematic recording of Yorkshire plants, and so assist the recorders and possibly bring in workers who are interested in this work. (*b*) the Ecological Committee to continue the survey work of the old Committee. In this way we shall receive annual reports from both sides of the section's activities, and it is hoped this will obviate the trouble to which Mr. Flintoff refers. Another matter he mentioned was the removal or destruction of rare or interesting plants, and suggested the Union should take some action. It was pointed out that the matter had been discussed at the British Association, and a sub-committee appointed to draft a suggested bye-law, and so the matter was decided to be best left over at present.

After tea, Mr. Malins Smith read a paper on 'Some Observations on the Conjugation of Spirogyra,' and Mr. W. E. L. Wattam on 'Lichen Habits.' These papers were of such wide interest that the authors were asked to submit them for publication in *The Naturalist.*

A vote of thanks was given to Professor Priestley for his kindness in inviting the section, and for arranging for the very acceptable cup of tea.—CHRIS. A. CHEETHAM.

——: o :——

Dr. T. W. Woodhead has been elected a member of the Town Council of Huddersfield.

We have received a well-illustrated account of 'Uber sibirische Heliciden,' by Hans Schlesch, reprinted from *Archiv fur Molluskenkunde.*

We have received interesting annual reports of the various sections of the Halifax Scientific Society, from which it would appear that the members are paying particular attention to the Fauna, Flora and Geology of their area.

'Dorothy Una Ratcliffe' writes 'On an Old Map of Yorkshire' in the autumn issue of *The Jongleur* :—

> Here *stood Auburn, Hartburn, Hyde*
> Villages the sea has taken ;
> How many lovers were forsaken,
> Laughed and sorrowed and loved and died,
> In sea-buried Auburn, Hartburn, Hyde ? '

In *The Geological Magazine* for November, Mr. F. W. Anderson has a paper on 'The Lower Carboniferous of the Skyreholme Anticline, Yorkshire,' illustrated by map and sections. 'The area east of the Burnsall Knolls in the north-east Lowlands of Craven is occupied by limestones of the northern facies type, apparently unaffected by the presence of the North Craven Fault. The beds are overlain unconformably by the Grassington Grit, which, overstepping the flanks of the Skyreholme anticline, thus continues to the south the unconformity noticed north of the fault. It is suggested that the line of the Skyreholme anticline is the axis of uplift which gave rise to pre-Millstone Grit denudation. Passing westwards, the beds become Reef-like in character and eventually grade into the Reef limestones of Burnsall.'

In the Seventy-fifth Annual Report of the Free Public Museums of Liverpool, just to hand, we notice there are four pages of particulars of donations. Among these we observe : Bellis & Meek, Ltd., Queen Square, Liverpool, one spider ; Dean, Messrs. Chas. White, Ltd., Queen Square, Liverpool, one spider ; Dowd, Alderman Thos., Moorfields, Liverpool, one spider ; Fearson, G., 56 Empire Street, West Derby Road, Liverpool, one spider ; Fitspatrick, Messrs., Queen Street, Liverpool, one spider ; Powell, A. J., 46 Emery Street, Walton, Liverpool, one common spider ; Wyatt, J. J., 212 New Chester Road, Port Sunlight, Cheshire, one spider ; Howard, A., 68 Rydal Street, Breck Road, Liverpool, one spider and cocoon. We are presuming there is more in this list than meets the eye, otherwise, doubtless, many museums could print quite a long list of additions. There are, of course, other specimens in the list, some being valuable.

CLASSIFIED INDEX.

COMPILED BY W. E. L. WATTAM.

It is not an index in the strictest sense of that term, but it is a classified summary of the contents of the volume, arranged so as to be of assistance to active scientific investigators; the actual titles of papers not always being regarded so much as the essential nature of their contents.

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CORRIGENDA.

Page 170, line 2, *for* 'Mr. S. Gordon' *read* 'Mr. A. Gordon.'

,, 170, line 4, *for* 'Noctules' *read* 'Noctule.'

,, 170, line 10, *for* 'Sedworth' *read* 'Aldworth.'

,, 253, line 2 from bottom, *for* 'Mining' *read* 'Living.'

,, 253, line 3 from bottom, *for* 'Memetic' *read* 'Mimetic.'

,, 253, line 13 from bottom, *for* 'Schiffermulleiia' *read* 'Schiffermulleria.'

,, 253, line 15 from bottom, *for* 'Briton's' *read* 'Britain's.'

1928 Dec. 1

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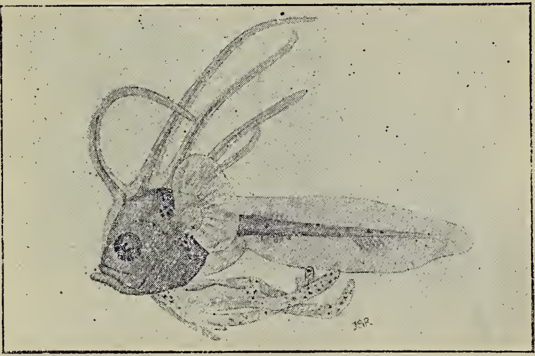

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